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Pelvic Floor Physical Therapy and Women's Health

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Abstract

Personalized approaches for the management and maintenance of women's pelvic health are increasingly in demand. As pelvic floor dysfunction is multifactorial and origins vary, it is essential as a clinician, to be familiar with available interventions to address each of these dysfunctions and their causes. This chapter will discuss the role of physical therapy in the management of female patients presenting with pelvic floor dysfunction related to bowel, bladder and sexual health with focus on variations associated with age. Each section addresses a specific type of pelvic floor dysfunction, discusses the methodology for management, as well as the efficacy of the physical therapy intervention related to treatment of each diagnosis.

Keywords: pelvic floor physical therapy, sexual dysfunction, urinary incontinence, pelvic organ prolapse, constipation

1. Introduction

Addressing the muscular strength, coordination and mobility required for healthy pelvic floor function, in addition to providing education regarding healthy bowel and bladder habits and establishing diet and lifestyle modifications, physical therapists are poised to provide care that directly impacts women's overall well-being and quality of life. Physical therapists who treat pelvic floor dysfunction have completed post-graduate training in the specific anatomy, physiology, functions and treatment of impairments of the pelvis. Pelvic floor physical therapists complete internal vaginal as well as external vulvar, abdominal, hip and spine screenings to establish differential diagnosis [1]. Interventions employed by physical therapists are varied and dependent upon diagnosis as well as patient and clinician preference but can include internal and external manual therapy, therapeutic exercise and neuromuscular reeducation, and utilization of modalities such as biofeedback, rectal balloon manometry,

electrical stimulation and transcutaneous electrical nerve stimulation (TENS) [2]. Pelvic floor physical therapists establish plans of care based on physician's referral orders, patient goals and baseline functional measurements. These plans of care utilize home exercise programs to supplement in-clinic treatment and maximize efficacy of physical therapy intervention [1].

Pelvic floor physical therapy is an important tool in the conservative management of sexual dysfunction, urinary incontinence, pelvic organ prolapse and constipation [2]. Understanding of the role and efficacy of physical therapy intervention in the treatment of these impairments is important in providing patients with thorough and optimal care.

2. Management of types of sexual dysfunction through pelvic floor physical therapy

Sexual function from a physical perspective involves the integrity and synchronization of neurologic, hormonal, vascular and muscular systems [3]. The adaptations these systems undertake throughout a woman's lifespan to accommodate gestation, delivery, post-partum healing and menopause can result in physiologic disruption resulting in sexual dysfunction. Common presentations of sexual dysfunction in women include chronic pelvic pain syndromes, musculoskeletal conditions and sexual pain disorders [4].

Chronic pelvic pain is multifactorial and greatly affects sexual function. Pelvic pain may develop following somatic dysfunction, after pelvic or psychological trauma, childbirth or surgical intervention, and it may be idiopathic or pathologic [5–7]. Of the multitude of factors contributing to chronic pelvic pain, perhaps the most responsive to physical therapy intervention is the condition of overactivity of pelvic floor musculature—also known as high tone pelvic floor dysfunction. Prolonged overactivity of pelvic floor muscles (PFM) can lead to hypertonicity and functional tissue shortening [6]. In addition to decreased length of contractile tissue, mobility restrictions can affect neural and fascial function, resulting directly in pelvic pain or worsening of the condition. Physical therapy intervention aimed at improving tissue length, mobility, and decreasing trigger points has been shown to positively impact sexual function. In a 2012 study by Fitzgerald, 60% of women who underwent treatment for interstitial cystitis/painful bladder syndrome with myofascial physical therapy (PT) reported moderate to marked improvement in symptoms, compared to 26% in the control group treated with non-pelvic/global massage only [8]. Interventions for the treatment group consisted of internal and external techniques aimed at connective tissue manipulation for tissue lengthening and proprioceptive awareness.

Musculoskeletal conditions can impact the actual structure and anatomy of the pelvic floor and create mechanical impairments leading to sexual dysfunction [4]. Coccygeal fractures from falls, perineal tears and episiotomy scars and pelvic surgeries change the mobility and angle of pull of pelvic floor musculature. Kinematic changes to pelvic floor soft tissue increase likelihood of dysfunction including hypertonicity, weakness, and loss of coordination. For example, increased tone of the obturator internus or piriformis may result in impingement of the pudendal nerve causing pain with sitting, numbness, and tingling along the ipsilateral

thigh as well as pain with intercourse [7]. In many cases, manual internal soft tissue mobilization of these muscles—along with neural mobilization and core stability training—has been shown to help relieve even severe pudendal nerve pain. Musculoskeletal conditions can also present in conjunction with other diagnoses. A study by Mieritz et al. showed lumbosacral mobility impairments and positive pain provocation tests for sacroiliac joint dysfunction in 51% of study participants with chronic pelvic pain and suspected endometriosis [9]. Musculoskeletal restriction in thoracolumbar spine can impair ilioinguinal, iliohypogastric and genitofemoral nerve function, while sacral disruption can affect pudendal and posterior femoral cutaneous nerves, adding to pelvic floor dysfunction [7]. An important population to consider with musculoskeletal conditions affecting sexual function is that of postpartum women. These patients develop loss of pelvic floor muscle strength and function following vaginal delivery, and this state negatively impacts the stimulation and arousal required for orgasm [10].

Sexual pain disorders are classified as dyspareunia and vaginismus by the DSM-5. Dyspareunia includes provoked, localized vulvodynia and vestibulodynia, with suggested etiologies ranging from hormonal and neurologic changes to inflammatory response and high tone pelvic floor disorder [11]. Each of these proposed etiologies can be impacted by physical therapy interventions as part of a multidisciplinary approach. Use of manual techniques to improve fascial, visceral, neural and muscular mobility has been shown to improve sexual outcome scores in women with levator-related pelvic pain. In a 2014 study by Zoorob et al., two groups of women reporting dyspareunia were treated with either pelvic floor PT or levator-directed trigger-point injections. Results from this study demonstrated improvement in both groups, however the group receiving PT demonstrated a greater overall improvement in sexual function based on sexual function scores [12]. In addition to decreasing pain with intercourse, some studies have shown that pelvic floor physical therapy intervention can actually help increase sexual pleasure [13, 14]. Improvements in sexual pleasure may include better orgasmic and arousal potential, desire, excitement and lubrication [13]. While PT intervention alone has been shown to be effective in a patient's functional recovery, it is important to consider a multimodal approach to sexual dysfunction to address physical, psychological and social barriers to optimize function on all levels.

3. The role of physical therapy in treatment of urinary incontinence

Urinary incontinence is a significant concern for women globally, with proposed incidence of 41% in women over the age of 40 [15]. Incidence of urinary incontinence has been observed to increase with age, parity, and obesity [7, 16]. Hormonal changes with age, including decreasing estrogen and testosterone levels have an effect on urethral patency and pelvic floor muscle strength. Aging is also associated with a decrease in overall activity level, which contributes to disuse atrophy of the supportive pelvic floor musculature. It also results in a higher incidence of weight gain due to hormonal changes, increasing abdominal girth and intra-abdominal pressure (IAP). As parity increases, so do the effects of labor, including tissue laxity and neuropathy.

Physical therapy intervention is appropriate for management of all these physiologic changes and has been shown to be effective as first-line treatment for urinary incontinence. In a Cochrane review by Dumoulin et al. in 2014, pelvic floor physical therapy (PFPT) was shown to be more effective than no treatment or placebo drug in women with stress urinary incontinence (SUI) or a combination of urinary incontinence types. Subjects treated with PFPT alone reported better quality of life, fewer episodes of urinary incontinence and improved sexual functioning [17]. Improving pelvic floor muscle coordination and strength allows for improved bladder and urethral support, decreasing visceral translation during periods of increased IAP such as coughing, sneezing and laughing, and also increases urethral pressure, preventing urine leakage [18]. A 2013 study by McLain et al. demonstrated reduced bladder neck mobility during coughing and increased cross-sectional area of the urethra musculature in patients who underwent 12 sessions of weekly pelvic floor physical therapy [19]. The observed hypertrophy of the urethra sphincter is important in demonstrating the role of pelvic floor physical therapy in treatment of urinary incontinence in women who do not have intact pelvic floor muscles or who have strong pelvic floor muscles but have impaired urethral sphincters. In addition to hypertrophy of the urethral sphincter, increased strength of levator ani in the pelvis and increased clamping of the compressor urethrae while increasing urethral pressure markedly help in preventing incontinence [20]. Pelvic Floor physical therapy interventions are not isolated to training of intrapelvic musculature and benefit may be extended when paired with strength training of accessory muscles, such as the gluteal muscles, hip adductors and anterior abdominal wall musculature. Strengthening of the transverse abdominis (TrA)—in addition to intrapelvic musculature—has been shown to decrease effects of SUI and improve quality of life (QOL) in multiparous women [21]. Although pelvic floor physical therapy is available as an option for treating urge urinary incontinence, this is rarely considered in isolation to address and counteract the detrusor contractions [17, 22]. Physical therapy intervention for urinary incontinence also includes behavioral training related to urge suppression and voiding mechanics, dietary changes to avoid bladder irritants and neuromuscular retraining to address tonal abnormalities affecting muscle function [7].

Weight management, as demonstrated by the PRIDE study, is an important factor in the restoration of urinary continence. The study showed a 50% reduction in frequency and severity of SUI when subjects lost 10% of their bodyweight [16]. Despite the benefits of weight loss, many patients are hesitant to begin a weight loss program due to fear of injury or re-injury, lack of information or guidance on initiating a diet or exercise regimen, or even lack of resources, such as access to a gym. Physical therapists are uniquely positioned to establish safe and effective exercise programs and give nutritional guidance to patients attempting to reach a healthier weight to improve their incontinence. Many women also report decreasing or ceasing participation in regular exercise due to urinary incontinence experienced with physical activity. Participation in pelvic floor physical therapy to improve pelvic floor muscle strength and coordination prior to and during initiation of an exercise program will allow a woman to enjoy bladder control while engaging in physical activity. Evaluation of dysfunctional movement patterns and treatment of chronic pains and recurrent injuries are well within a physical therapist's scope of practice and will allow patients to feel confident increasing their activity level.

Gestation and delivery are both major factors in development of urinary incontinence [23]. Loss of anterior abdominal wall muscular strength with the progressing gestation results in

limiting of the body's ability to recruit accessory musculature for force-coupling of the pelvic floor muscle contraction. This decrease in core muscle activation, combined with increased intraabdominal pressure from the growing uterus and fetus, increases a woman's likelihood of developing urinary incontinence during pregnancy. A 2003 study investigated the role of a pelvic floor exercise regimen on the incidence of urinary incontinence in pregnant women [23]. Study participants in the treatment group reported significantly less urinary incontinence than the control group at 36 weeks gestation, as well as 3 months postpartum. In addition to the strain placed on the pelvic floor during gestation, vaginal delivery also presents the opportunity for neuromuscular injury. Prolonged labor, with sustained stretch of the levator ani muscles and the pudendal nerve, increases the likelihood of a woman developing neuropathy, affecting muscle strength and function and contributing to urinary incontinence [23].

Adherence to PFPT is multifactorial and includes attendance at each visit, performance of home exercise program between visits and the long-term adherence to home exercise plan [24]. Despite the efficacy of physical therapy treatment for urinary incontinence, as well as the low-risk nature of the intervention, adherence to PFPT has been reported as lower than 50% [25, 26]. A physician's understanding and support of PFPT and its role in conservative care may improve a patient's motivation to participate in PFPT and thus attaining improve outcomes.

4. The role of physical therapy in treatment of pelvic organ prolapse

Pelvic organ prolapse (POP) is a common issue in women following childbirth, with an estimated 94% presenting with evidence of POP noted during routine annual gynecologic examination (Swift 2000). POP is linked to urinary incontinence and sexual dysfunction and is the cause of approximately 200,000 inpatient surgical repairs in the United States annually [27]. Etiology of POP is multifactorial but generally speaking, involves descent of pelvic organs due to increased abdominal pressure, tissue stretch, and loss of functional support from pelvic floor soft tissue. Risk factors include both increased age and parity, obesity, history of excessive Valsalva maneuvers such as with heavy lifting and repetitive straining associated with chronic constipation. Patients with POP may present with bowel, bladder or sexual dysfunction and multiple studies have determined the efficacy of physical therapy intervention for each of these functions per se. A randomized control trial (RCT) by Breakken in 2010 sought to investigate the role of physical therapy intervention in treatment of POP. The study demonstrated statistically significant difference in bladder and rectal elevation with participation in pelvic floor strengthening exercises in the intervention group compared to the control group [28]. Within the study, conservative management of POP with pelvic floor physical therapy was shown to reduce symptoms of vaginal bulging or heaviness, and improve SUI, urge urinary incontinence and bowel symptoms of flatus and loose stool incontinence. Sexual dysfunction related to POP is typically attributed to vaginal obstruction and laxity, and contributes to sexual avoidance, poor body image, as well as reduced sexual desire and arousal [29, 30]. In another study by Breakken et al., women with stage I, II and III POP who underwent a pelvic floor physical therapy program, in addition to education on lifestyle modification, demonstrated a statistically significant medium association between improvement in sexual function and increase in pelvic floor muscle strength [31]. The author reported "Improvement in sexual

function included increased awareness, strength and control of pelvic floor muscles, sensation of a 'tighter vagina', improved self-confidence, libido and orgasms, resolution of pain experienced with intercourse and partner reports of sexual gratification." Physical therapy intervention for POP is aimed at functional restoration of pelvic floor muscles, with treatment addressing strength, endurance and coordination of soft tissue, in order to improve support of the pelvic organs. The POPPY trial in 2014, demonstrated further efficacy of PT intervention [32]. In their multicenter RCT, patients with symptomatic POP were randomized into PFPT intervention and control group, with both receiving lifestyle advice. The women who received pelvic floor physical therapy reported fewer POP symptoms at 12 months than the control group, and 80% of participants in the intervention group continued to perform pelvic floor muscle exercises at 12 months after trial entry. This continued adherence to exercise is important in long-term maintenance and management of symptoms and demonstrates further efficacy of PT intervention.

Surgical management of pelvic organ prolapse is typically necessary in symptomatic cases of grade III-IV and in women with significant negative impact on quality of life. Although most women are pleased with their surgical outcomes following repair, 25% require additional post-operative therapy [33]. Post-operative SUI due to poor pelvic floor muscle recruitment may be due to lack of training and coordination, as the patient most likely has not needed to perform a pelvic floor contraction since her prolapse became obstructive [34]. Post-operatively, lower urinary tract symptoms (LUTS) may also include increased daytime urgency and nocturia, in addition to other voiding or storage symptoms. LUTS caused by levator dysfunction, assessed by internal vaginal assessment, or behavioral factors such as dietary irritants or improper fluid intake volumes, assessed by patient interview and patient's completion of food and fluid diaries, may be addressed by a physical therapist pre-operatively, improving outcomes and patient satisfaction scores following POP repair.

5. The role of physical therapy in treatment of constipation

Constipation is a common impairment in children and adults and affects mental, physical and social functioning [35, 36]. An estimated 10–20% of adults worldwide report symptoms of constipation, which can include having a bowel movement fewer than three times per week, presence of hard, dry, small and difficult to pass stool, and pain with bowel movements [37]. Symptoms of constipation also include straining, bloating and the sensation of a full bowel. As constipation is multifactorial and commonly seen in conjunction with other pelvic disorders, it is important to understand the role of physical therapy interventions and utilize them to supplement care of constipation-related symptoms.

Constipation is generally considered a symptom. Amongst other causes, it can develop through poor dietary habits, slow-transit colon, pelvic floor muscle dysfunction, impaired anorectal angle and/or paradoxical pelvic floor contraction. Pelvic floor physical therapists may improve symptoms of constipation through behavioral modification, such as diet and fluid intake modifications and education on proper toileting habits and positions. Changing the angle of the patient's hips, for example, changes the anorectal angle during defecation, allowing for ease of bowel movement through relaxation of puborectalis. In a 2002 study by Rad et al., the

difference in bowel emptying while patients were seated on a European toilet compared to an Iranian-style toilet was investigated [38]. This position change puts the patient in a squatting position in the latter category of toilets. The study suggested complete bowel emptying on the Iranian-style toilet and incomplete bowel emptying while seated on the European-style toilet. Use of assistive devices such as the Squatty Potty™ and physical therapy to improve hip mobility and pelvic floor muscle function may allow for improved defecatory mechanics. Physical therapists may also offer patients nonpharmaceutical interventions to improve bowel motility, including abdominal massage and dietary modifications. Abdominal massage may stimulate peristalsis, decrease colon transit time, increase frequency of bowel movements and decrease pain and discomfort [39]. Abdominal massage may be performed in clinic and taught to the patient or caregiver for symptom management at home. Physical therapists may also encourage dietary changes as part of patient care. Important behaviors for improved bowel motility include increased water consumption and ensuring adequate fiber intake.

Biofeedback is another important tool in the conservative management of constipation. Biofeedback may be used in-clinic and patients may either purchase or rent a biofeedback unit for at-home use. Biofeedback is helpful in improving pelvic floor muscle strength in patients with low tone but is also used effectively in treatment of anismus or pelvic floor dyssynergia. A 2015 study showed a 48% improvement in patient symptom scores using the patient assessment of constipation-symptoms (PAC-SYM) questionnaire following 6–8 sessions of biofeedback therapy with manual and verbal biofeedback, surface electromyography (EMG), rectal balloon sensory therapy, pelvic floor and abdominal massage and core strengthening to correct dyssynergia [40].

Use of rectal ballooning in improving rectal sensation is a treatment some specially-training pelvic floor physical therapists may offer. Chronic constipation and rectal filling may lead to poor sensation in rectum and poor awareness of bowel movement. Pourmomeny assessed the efficacy of biofeedback and rectal balloon training showing decreased constipation in both groups; however, biofeedback training (79% improvement) was superior to balloon training (52% improvement) and should be implemented prior to balloon training [41].

An important consideration in the discussion of constipation management is that of opioid-induced constipation [42]. As the health care community becomes more aware of the negative side effects of long-term opioid dependence, it is imperative to seek out other less harmful analgesics. Physical therapy plays a role in pain management and functional restoration pre- or post-surgically, and can even be helpful in the prevention of injury with movement screenings for athletes or with clients prior to initiating an exercise program.

6. Conclusion

In conclusion, pelvic floor dysfunction is a multifactorial condition with significant overlap in causative factors and symptom presentation between sexual dysfunction, urinary incontinence, pelvic organ prolapse and constipation. Utilization of physical therapy intervention improves pelvic floor function and, allowing women to employ their bodies' own supportive structures to decrease impairments and maximize their quality of life.

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