Recent advances in the pelvic floor assessment and rehabilitation of Women with Pelvic Floor Dysfunction

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Abstract

Pelvic Floor Dysfunctions (PFDs) are a group of disorders characterized by inter-related symptoms of urology, gynaecology, colorectal or general pelvic pain. These mainly cause voiding or defecation disorders, pelvic organ prolapses, sexual dysfunctions and pelvic pain. PFDs adversely impact various domains of women's life including psychological, physical, social and sexual well-being. Pelvic Floor Rehabilitation (PFR) has been recommended as part of a multidisciplinary approach for evaluation and management of the multiple PFDs. The assessment of PFD has improved with utilization of new measurement tools and specific outcome measures for PFDs. PFR is a first-line treatment approach effective for PFDs. However, robust research is needed to test standardised assessment and physical therapy treatment protocols with long term efficacy. In this review, we discuss a range of PFDs, impairment-based classification, recent updates, and advances in the evaluation of PFDs, physical therapy tools and techniques for the treatment of PFDs.

Keywords: Pelvic floor, pelvic pain, rehabilitation, urology, gynecology

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Introduction

Pelvic Floor Dysfunction (PFD) is a global medical problem encompassing several disorders. It refers to combination of symptoms and anatomical changes related to dysfunctions of pelvic floor muscles (PFMs). Such dysfunctions exhibit either as increased, decreased or uncoordinated pelvic floor muscles activity that imparts mild to severe disablement in a woman's life (Table).[1]

Classification of Pelvic Floor Disorders:

Pelvic floor disorders can be classified based on symptoms or functional impairments.

A. Symptom-based classification:

International continence society categorizes PFDs into 5 domains related to lower urinary tract (Urinary incontinence, frequency, urgency, intermittent or slow stream or voiding difficulty), Bowel function (Faecal incontinence, urgency rectal prolapse and constipation), vaginal symptoms (Pelvic organ prolapse), sexual function (Dyspareunia and Vulvodynia) and chronic pelvic pain.[2,3]

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B. Function-based classification:

PFDs can also be classified as hyper or hypotonic based on increased, decreased or altered activity of PFMs. PFMs provide essential functions as mechanism for elimination or continence, lumbopelvic stability, pelvic visceral support and normal sexual activity.

In overactive or hypertonic PFDs, there is either difficulty or complete inability to relax PFMs resulting in pain and restriction upon vaginal palpation.[2,4] Such hypertonicity is associated with poorly learned evacuation techniques, obstetric trauma or sexual disorders.[1,5]

Underactive or Non-contracting PFDs are either storage or support deficits.[6] Storage deficit present in the form of urinary or faecal incontinence; an involuntary leakage of urine or stool/gas.[3] Support deficits may result in pelvic organ prolapse and often present as pelvic heaviness, pelvic fullness, low back pain, or voiding/defecation dysfunction.[7]

Pelvic Floor Rehabilitation:

Pelvic floor rehabilitation is a multifaceted approach to restore normal function of pelvic floor muscles by integrating abdominopelvic coordination/stability with motor function/sensitivity in the process of continence or elimination and respiration. It requires careful assessment, accurate diagnosis, cognitive and psychological evaluation and motivation for adherence to the treatment protocols.[5]

A. Assessment and Evaluation

Evidenced-based specific assessment tools or techniques are available for PFD evaluation.[8] History taking is the cornerstone of assessment and may utilize standardized condition-specific questionnaires. Subjective assessment for urinary incontinence includes inquiring about the quantity and frequency of urine voided, triggering factors or events along with bladder diary.[3] Objective method of PFMs strength assessment is by digital vaginal palpation. It assesses voluntary contraction on modified manual

Table: Pelvic Floor Dysfunctions, associated symptoms and PT assessment and management tools.

Type of Dysfunction	Common Presentation	Associated PFM Examination Findings	Assessment Tools & Diagnostic Criteria	Pelvic PT Measures
Hypotonic PFDs	Storage incapacity i.e. incontinence: urinary and faecal Support deficit i.e. Pelvic Organ Prolapse	Weakened PFM Reduced endurance and co-ordination Increasingly relaxed pelvic floor Slipping or downward descent of organ (or part)	History and subjective examination Digital Vaginal Palpation PERFECT Scoring Perineometer Musculoskeletal ultrasound Bladder diary EMG1 Bristol stool chart 2-week bowel diary Pelvic Organ Prolapse Quantification system (POP-Q) Braden Walker quantification system Anorectal manometry Balloon expulsion techniques.	PFM Exercises Electric stimulation EMG Biofeedback Perineometer PFM exercises with diaphragmatic breathing Co-contraction of anterolateral abdominal muscles Hypopressive exercises Proprioceptive training using vaginal weighted cones Bladder & Bowel training Kinesio taping
Hypertonic PFDs	Delayed/hesitant voiding (urinary or faecal) Sexual dysfunction Inflammation Atrophy Pelvic Pain	Non-relaxing pelvic floor Pain and discomfort upon internal examination	Ultrasonography EMG Visual Inspection along with PFM2 contraction Vaginal Examination (with/without speculum)	**Manual therapy:** Connective tissue manipulation, Trigger point release, Joint or nerve mobilization, Scar tissue mobilization EMG Biofeedback Electric stimulation Dry needling Interferential Therapy TENS3 using transvaginal electrode Vaginal dilators Self-massage PFM training.

[1]EMG: electromyography, 2PFM: Pelvic Floor Muscle, 3TENS: Transcutaneous Electrical Nerve Stimulation.

muscle testing grades of 0-5, the grade 0 indicate no contraction and 5 shows maximum voluntary contraction of PFM. PERFECTR method (P, power; E, endurance; R, repetitions; F, fast contractions; ECT, every contraction timed; R, ability to relax) allows the measurement of a range of factors associated with PFM function in women suffering from urinary incontinence.[7,9]

The dynamics of defecation disorders are assessed through defecation scores, bowel diaries, Bristol stool chart and Rome IV criteria.[10] Rectal examination scores, like digital examination for scoring system or three axial perineal evaluation scores, are also useful to look for anatomical or functional abnormalities and possible faecal stasis. Other objective methods for assessment of such disorders are manometry, balloon expulsion test, defecography and pelvic ultrasound.[11] The distinct diagnosis for type and grade of prolapse, physical examination, Pelvic Organ Prolapse Quantification system, or Braden Walker quantification system are routinely advised.[5,12]

Globally sexual Disorders have been reported in 40% of women in their prime reproductive years.[13] Visual inspection, Q-tip testing and vaginal examination are some of the assessment methods for vulvodynia.[1] Myofascial Pelvic Pain, a disabling and chronic pain condition, is diagnosed mainly on the basis of history and physical examination. Ultrasonography, electromyography and measuring the turn-amplitude analysis are reliable tests, but not widely used in practice.[14,15]

B. Treatment and Management Strategies

The management and rehabilitation strategies for PFD are multidisciplinary. PFM functional alterations like altered muscle tone, strength and coordination deficit, speed of contraction and poor muscle endurance are linked with various PFDs.[7] Systematic review of clinical guidelines has recommended PFR as an effective, first-line, minimally invasive and low-risk therapeutic approach.[5] Women Health PTs have specialized training to evaluate and treat PFDs that arise or affect women's pelvis throughout the continuum of their life span from puberty to peri-partum

to menopause. PFR aims to restore normal function by integrating lumbopelvic stability, elimination or continence and respiration.[16]

Hypotonic PFDs

Physical therapy methods to improve PFMs contraction include correct instructions for PFM voluntary contractions.[7] These include closing the urethra or bringing posterior and anterior openings together, which are basic but difficult trainings guided by physical therapists. PFM strengthening can also be facilitated manually by the internal vaginal palpation method. Electric stimulation using intra vaginal or rectal electrodes can be applied to stimulate weak PFMs. EMG Biofeedback using perineometer is another adjunct used for neuromotor training of patients with incontinence using audio and visual feedback. Therapeutic PFM exercises with diaphragmatic breathing and co-contraction of transversus abdominus, abdominal hypopressive exercises, proprioceptive training using vaginal weighted cones, bladder and bowel habits training.[9] Star shaped Kinesio taping with 75-100% stretch over the sacral region, reflex zone of the bladder, is another treatment option to control symptoms of overactive bladder.[17]

Hypertonic PFDs

Manual therapy, a hands-on clinical approach, is shown to be effective in pelvic pain management associated with dyspareunia and vaginismus. Myofascial trigger point release is recommended as a first-line therapy to alleviate local and referred musculoskeletal pelvic pain.[18] American College of Obstetrics and Gynecology recommends mobilization techniques for pelvic visceral connective tissue, pelvic girdle joints and pudendal nerve along with a multitude of physical therapy options; as part of a successful treatment plan for vulvodynia.[19]

Several electro-therapeutic modalities are found to be effective for PFR.[5] Surface electromyographic biofeedback is an adjunct therapy for neuromotor training of weak or tight PFMs. Internal electrodes are placed and the patient is instructed to contract or relax PFMs following audio or visual feedback. Similarly, electrical muscle stimulation provides a small electrical current via rectal or vaginal electrodes to stimulate PFMs in isolation when there is no or very weak voluntary contraction. Pain modulating modalities like transcutaneous electrical nerve stimulation and Interferential current therapy are effective in pain management found in hypertonic PFDs.[4] Similarly, the use of progressive vaginal dilators along with self-massage and PFMs exercises is a helpful tool to restore PFMs and vaginal tissues in hypertonic disorders.

Conclusion

Pelvic floor rehabilitation is a minimally invasive, first-line preventive and treatment approach for a range of PFDs. There is evidence for the efficacy of available physiotherapeutic tools and techniques. However, well-designed trials are required to validate evaluation techniques and establish the long-term efficacy of standardized treatment protocols for PFDs.

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