

**Conservative therapy for overactive pelvic floor muscle (PFM)**  
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**Workshop #16 Pelvic pain in patients with lower urinary tract symptoms**

**Outline**

|  | Overactive PFM | Pain management | Trigger point treatment |
|--|----------------|-----------------|-------------------------|
| Manual therapy   | X              | X               | X                       |
| Moist Heat   | X              | X               | X                       |
| Cold   | X              | X               |                         |
| Therapeutic Ultrasound   | X              | X               | X                       |
| Dry needling of trigger points   |                |                 | X                       |
| Electrotherapeutics  | X              | X               | X                       |
| EMG Biofeedback  | X              |                 |                         |
| Vaginal or rectal dilators   | X              |                 |                         |
| Aerobic exercise and<br>Therapeutic exercise of other<br>pelvic girdle muscles |                | X               |                         |
| Functional training in self-care<br>and home management                        | X              | X               | X                       |

**Systematic review of treatment for the overall category of chronic pelvic pain (CPP) (Tu 2005)**

- 29 studies which met entrance criterion
- Most had design flaws and lacked standard definitions and criterion
- Only 2 studies with control groups and both had study design flaws and small sample size (neither study included overactive PFM)
- 16 appear to have focus on overactive PFM
- Most are observational case reports or series
- Studies were published from 1960 to 2004 with only 5 studies less than 15 years old
- Conclusion – not enough evidence to know which treatments work.

**Comparison of behavioral and surgical treatments**

- Patient population for these two studies was vestibulitis – not specific to overactive PFM
- Comparison of groups shows no significant difference in outcome (Weijmar Schultz 1996)
- Both groups had significant pain reduction and quality of life scores – patient who underwent surgery did have more pain relief (Bergeron 2001)
- Conservative management can be very effective and should be offered as a first line treatment for vestibulitis

### **Multi-disciplinary team approach to pelvic pain management**

- “The optimal approach to treatment (of pelvic pain) requires integration of the mind and body of the patient, medical and surgical treatment and attention to other medical and health-related issues the patient may face.” (Steege 1998)
- “Access to multidisciplinary chronic pain management should be available for women with CPP” Consensus Guidelines for the Management of Chronic Pelvic Pain (Jarrell 2005)
- Case report highlighting importance of the interdisciplinary team (Neville 2008)
- Interdisciplinary team is more effective in managing neuropathic pain syndromes, preventing unnecessary emotional and physical impairment, and controlling medical costs (Harden 1998)
- Multi-disciplinary approach to provoked vestibulodynia resulted in pain reduction and return to intercourse in 80% of patients 3 to 7 years after treatment (Spoelstra 2011)
- “Management of pelvic pain is most effective when a multidisciplinary team of physician, physical therapist, and psychologist is concurrently involved in patient treatment from the outset.” RCT (Peters 1991)
- Organ generated pain can perpetuated muscle trigger points and muscle trigger points can perpetuate or mimic organ dysfunction (Doggweiler-Wiygul 2004)

### **Manual therapy**

- Manual therapy refers to a group of hands on treatments including:
  - Myofascial release (MFR), scar massage, soft tissue massage, Theile’s massage, trigger point release
    - Used for overactive PFM, loosening of non-contractile tissues, and pain management
    - Can all be helpful inside the vagina and rectum as well as associated muscles such as the piriformis, gluteal, abdominals, and adductors.
  - Joint mobilization / manipulation of the spine (T11 to L5), pubic symphysis, hips, and sacroiliac joints
- Most studies combine manual therapy treatment with other conservative treatments making it difficult to evaluate the effectiveness of the manual therapy alone (Frawley 2007)
- Treatment usually starts with ischemic pressure holding mild to moderate pressure on tender areas until tissue softens 2 to 5 minutes. Repeat in all painful areas
- Progression of treatment would include sweeping across or along muscle fibers several times in several areas.
- Internal vaginal or rectal MFR – Interstitial cystitis (IC) (Weiss 2001)
  - 1 to 2 times per week for 8 to 12 weeks
  - Combined with EMG training for the PFM, relaxation training and external PFM MFR and injections when indicated
  - 65% improvement in resting PFM tone on EMG
  - 70% of had moderate to marked improvement of symptoms

- Deep tissue mobilization of rectal PFM males with CPP (Anderson 2005)
  - Weekly for 4 weeks and biweekly for 8 weeks
  - Combined with voluntary contraction and release/hold-relax/contract-relax/reciprocal inhibition; specific breathing technique to quiet anxiety and relaxation training of the body with simultaneous relaxation of PFM
  - 72% reported marked improvement after therapy
- Self-internal rectal / vaginal massage of patients with CPP(Anderson 2011)
  - Curved tool used to massage internal PFM trigger points
  - 95% of patient felt wand was at least moderately effective in decreasing pain
  - Three patient reported rectal bleeding following use of device
- Thiele rectal massage women with IC and overactive PFM (Oyama 2004)
  - 2 times per week for 5 weeks
  - A statistically significant improvement was seen in QOL and pain on palpation immediately after treatment and 4 to 5 months after treatment
- RCT of a feasibility study of manual physical therapy (MPT) or traditional global therapeutic massage (GTM) of patient with self-proclaimed CPP ( Fitzgerald 2009)
  - Patients were randomized - 10 weekly, 1-hour treatments of either MPT or GTM
  - ‘Responders’ = ‘moderately’ or ‘markedly’ improved.
  - MPT group responders 13/23(57%), GMT group responders 5/24(21%) (p=0.03)
  - Manual physical therapy appears to have better outcome than general massage
- Older manual therapy research (Tu 2005)
  - Thiele 1963 – 68% cured
  - Sinaki 1977 – 59% complete or partial resolution
  - Grant 1975 – 68% relief
  - Cooper 1960 – 80% complete relief
- Joint mobilization for overactive PFM – to date there is no research focused on joint mobilization however there is evidence that pelvic joint dysfunction can perpetuate PFM trigger points. Therefore treatment of pelvic joint dysfunction is recommended for full resolution of overactive PFM – expert opinion (Doggweiler-Wiygul 2004, Lee 2011)
- Combination manual therapy – MFR and joint mobilization (possibly with other treatments)
  - Vaginismus (Holland 2003)
  - Vestibulitis (Bergeron 2002)
  - Interstitial cystitis (Lubkan 2001, Messelink 1999)
  - “Short pelvic floor” (FitzGerald 2003)
  - Coccyx pain (Maigne 2001, 2006)
  - Prostatitis (Potts 2000)

## Physical, electro-therapeutic and mechanical agents

### Moist Heat

- Local thermal stimulation (heat pad to the infragluteal region or warm bath) (Jiang 1999, Dodi 1986)
  - Multiple pain diagnosis including anorectal pain, hemorrhoid, and fissure
  - Relaxation of the hypertonic internal anal sphincter measured by anal manometry
  - Response beginning 3 minutes after heat application
- Lack of scientific data to support the use of sitz baths (hot or cold) in the treatment of anorectal disorders or perineal pain (Tejirian 2005)
- Heated rice sack on coccyx / rectal area 10 to 20 minutes daily to increase circulation and decrease pain

### Cold Treatment

- Post-partum perineal pain and edema - No significant difference with the use of heat or cold (Hill 1989)
- Used most often with acute pain syndromes
- Some patients with “burning” sensations of the perineum may find cold soothing
- Long term use of cold should be discouraged as it has been shown to decrease muscle resting length (Travel 1999)

### Therapeutic Ultrasound Treatment

- General usage
  - Scar pain or adhesions: surgery, episiotomy, trauma (Creates 1987, McClaren 1984)
  - Muscle spasm: vaginismus, anismus, pelvic girdle muscles (Lilius 1973a, 1973b)
  - Swelling, hemorrhoids, perineal bruising: (Grant 1989)
  - Muscle trigger point:  $0.5 \text{ W/cm}^2$  (Travell 1999)
- Cochrane Review of ultrasound for perineal pain (Hay-Smith 2002)
  - “Insufficient evidence to make any definite conclusion about the benefits, or otherwise, of therapeutic ultrasound for the treatment of acute or persistent perineal pain and dyspareunia.”
  - Inconsistencies between studies (ie, differing treatment parameters, variable times to intervention post-delivery) make it difficult to draw clinically relevant conclusions
- Levator ani syndrome
  - $1.0$  to  $2.5 \text{ W/cm}^2$  around anus 5 to 10 minutes, 15 to 30 successive days
  - 74% cured or improved when combined with massage and exercise (Lilius 1973a)
  - 26% cured when combined with bladder distension (Lilius 1973b)
- Decreased perineal pain
  - Treatment 62.2%, sham 30% (Creates 1987)
  - Treatment group - greater improvement in pain than sham (McClaren 1984)
- Perineal bruising - treatment group had faster dispersal of bruising and less pain than the control group (Grant 1989)

### **Dry needling of trigger points**

- Insertion of small filament needles directly into the trigger point
  - PFM near the coccyx / external anal sphincter
  - Superficial perineal muscles
  - Inside the vaginal canal
  - Other pelvic girdle muscles – abdominals, adductors, gluteals
- Results in decrease in electrical activity of the trigger point and elongation of muscle fibers (Dommerholt 2006)
- Consider licensing limitations of your area.
- No studies were found but the technique is described in several books and papers (Travel 1999, Long 1956, Waters 1937, Dommerholt 2006)
- Many locations to get education including <http://www.kinetacore.com/> Advanced Dry Needling Course for the Pelvic Floor
- Trigger point injection of the PFM vaginally has been successful in decreasing pelvic pain (Langford 2007)

### **Electrotherapeutic:**

- Many wave forms and parameters, often not reported in the literature
- Very difficult to assess benefit for overactive PFM
- Sensory application - used primarily to activate sensory nerves for neuromodulation (re educating the nerve) and gating of pain
- Motor application – there is little evidence that it is possible to stimulate a muscle to fatigue although some practitioners subscribe to this theory

### **Electrical muscle stimulation (ES)**

- Usually biphasic pulsed wave at high frequency (100 to 200 Hz, 250 to 400 usec) internal vaginal or rectal probe
- Prostate pain syndrome - statistically significant improvement in NIH-CPSI score; 60/62 reported significant relief or cure (Ye 2003)
- CPP and overactive PFM - retrospective study, 68% of patients reported decreased pain after intravaginal stimulation; no control group (Fitzwater 2003)
- Dyspareunia - 10 sessions of intravaginal ES at 8 MHz, 30 minutes, 2 to 3 times per week: less complaint of dyspareunia, alleviated pain up to 7 months after treatment (DeOliveria 2005)
- Pelvic pain in men - rectal electrical stimulation 20 Hz, 20 minutes, continuous, weekly 8 sessions, treatment appears to be helpful in 17 of 20 patients (Park 1999)
- Vaginismus – electrical stimulation with biofeedback and dilator training resulted in all 12 participant's return to intercourse (Seo 2005)
- Pelvic pain – vaginal electrical stimulation and PFM strengthening 76% had improved pain (Petros 2004)

### Transcutaneous electrical nerve stimulation (TENS)

- Most research on CPP and pain management – unclear affect on overactive PFM
- External electrodes usually placed near the sacral nerve roots posteriorly
- General TENS has proved to be remarkably safe and provides significant analgesia in about half of patients experiencing moderately predictable pain (Rushton 2002)
- Primary dysmenorrhea - high frequency TENS (50-100 Hz) more effective than low frequency TENS, placebo, or acupuncture. (Proctor 2002)
- IC - pain and symptoms improved in 26% of patients without ulcers and 54% of patients with ulcerative disease (Weina 2002)

### High-volt pulsed current (HVPC) / electrogalvanic twin peak dual pulse wave

- Levator ani syndrome, overactive PFM (Sohn 1982, Nicosia 1985, Morris 1997, Oliver 1985, Hull 1993, Billingham 1987, Ger 1993)
  - Parameters vary: 80 to 120 Hz, 15 to 60 minutes per treatment, 150 to 400 volts to patient tolerance, frequency and duration vary greatly (daily to 3 times per week, 5 to 10 treatments), negative pole at the rectum
  - 50% to 90% relief
- Chronic a-bacterial prostatitis - not specific to overactive PFM (John 2003)
  - 2 times per week, 30 minutes, 5 weeks, 450 to 500 Hz
  - Pain improved in 83%, but did not continue 3 months after treatment ended

### Other electrotherapeutic modalities

- Low level laser therapy (cold laser, infrared laser, light therapy) (no studies)
  - PFM spasm, pain and dyspareunia
  - S2-4 nerve roots on the effected side for 30 seconds before other treatments
- Iontophoresis
  - Sacrococcygeal joint pain, labial pain (no studies)
  - Peyronie’s disease (Treffilette 1997)
  - Dexamethosone, placed over dysfunction, typical parameters
- Interferential wave is said to reach deeper into tissues, can be used for CPP (no studies)
- Shortwave and microwave diathermy - Deep heating modality that has been used for pelvic pain in the past
- Magnetic electrical stimulation - Two studies in patients with CPP, none specifically investigated overactive PFM (Frawley 2007)

### Principles of PFM training in patients with overactive PFM

- Aggressive PFM strengthening usually increases pain in patients with overactive PFM
- Relaxation or down training initially helps to restore normal muscle tone, increase circulation in the muscle and decrease pain
- Restoring PFM elongation and length through manual therapy may be necessary before any strength or contraction training (Frawley 2007)
- “Tenderness of PFM may be improved by decreasing muscle tension” (Tu 2005)
- Pelvic pain (Skilling 2004) – ES and PFM strengthening, 76% improvement

## EMG Biofeedback

- General relaxation training or specific PFM training
- Biofeedback to facilitate isolation of contraction/relaxation of PFM – with the focus on relaxation first can be helpful in decreasing overactive PFM and pain (Doggweiler-Wiygul 2004, Lubkan 2002, Bergeron 2001, Glazer 1995, McKay 2001, Cornel 2005, Bassotti 2004, Heah 1997)
- Often combined with cognitive behavioral training and education listed below
- General biofeedback principles
  - Early biofeedback research shows muscle tension may be present without patient awareness (Basmajian 1983)
  - As little as an increased resting tone of 10% of maximum voluntary contraction can decrease circulation significantly and contribute to trigger points (Cram 1998)
  - 2/3 of dysfunctional muscles will have normal resting baseline (Cram 1998)
  - Patients with pelvic pain may have normal resting baseline (Potach 2006)
  - Some patients with PFM pain may not benefit from EMG training
- Obstructed defecation (Nogueras 1992, Battaglia 2004, Enck 1993, Wexner 1992, Lewicky –Gaupp 2008)
  - 50% to 74% success with EMG down training and coordination training
  - Often combined with behavioral training
- Anorectal pain (systematic review) - EMG is “possibly efficacious” “insufficient data” for further recommendations (Palsson 2004)
- Vulvodynia (Bergeron 2001)
  - EMG biofeedback with contract/relax of the PFM
  - 8 weekly sessions and home trainer use 2x/ day
  - Significant pain reduction in 34.6% of participants
- Vulvodynia (Glazer 1995, McKay 2001)
  - Aggressive contract / relax EMG training
  - Stability of the muscle at rest (standard deviation of 0.5 to 1.0) was the only predictor of decreased pain
  - 52% to 69% reported pain-free intercourse
- Males with overactive PFM (Clemens 2000)
  - Significant improvement in quality of life and symptoms scores, decreased pain and increased voiding interval
  - Biweekly treatment and timed voiding
- Males with CPP (Cornel 2005)
  - Anal EMG: hold/relax, weekly for 6 to 8 weeks
  - Average PFM tone - initial 4.9 uV, final 1.7 uV
  - 97% of men had improvement in symptoms

### **Vaginal or rectal dilators**

- For stretching of PFM and non-contractile tissue of the pelvis
- Insertion of gradual increasing dilators
- Can be used with EMG feedback to encourage relaxation during insertion
- Desensitization of the vaginal vault to penetration / practice intercourse (Husted 1975)
- Significant increase in spontaneous bowel movements and decreased laxative use in patient with puborectalis syndrome and constipation (Maria 1997)
- Improved ability to tolerate penetration in 77.8% to 98% of patients (Idama 2000, Fuchs 1980)

### **Aerobic and general exercise**

- Aerobic exercise maintains homeostasis of the parasympathetic (increased) and sympathetic (decreased) systems, at rest and during exercise – applicable to chronic pain in general (Goldsmith 2000)
- Case reports and clinical evidence - general aerobic exercise helps to decrease pain and increases function in patients with IC (Karper 2004)
- Yoga and breathing exercises have been suggested for overall rehabilitation
- Clinically patients report daily walks decrease pain

### **Therapeutic exercise of other pelvic girdle muscles**

- No RCT studies on the effect of exercise of other pelvic girdle muscles on overactive PFM
- Stretching into intercourse positions during PFM relaxation training may help patients maintain relaxation of the PFM during intercourse
- Abnormal pelvic girdle muscle length and strength increases strain on dysfunctional pelvic joints (Lee 2011)
- Exercises to restore length and strength of the pelvic girdle muscles may decrease overactive PFM and can decrease overall pain perception
- Some pelvic girdle muscle refer pain to the PFM and PFM trigger points can refer pain to coccyx and buttock area
  - Gluteals
  - Adductors
  - Hip rotators – obturator internus and piriformis
  - Iliopsoas
  - Abdominals
  - Quadratus lumborum

### **Functional training in self-care and home management**

- Posture and body mechanics education
  - Decreasing strain on injured pelvic joints
  - Posture instruction (standing, lying, and sitting) - marked improvement or complete resolution in 19 of 35 patients with overactive PFM (Sinaki 1977)
  - Avoidance of slouched sitting appears to be important in decreasing irritation on overactive PFM
  - Body mechanics and ADLs – lifting, exercise, and intercourse positions
- Education
  - Location of perineal structures, visual and palpation
  - Skin disturbances → myofascial hyperirritability (Travell 1999) – teach patients to avoid irritants to vulvar skin
- General relaxation training and stress management
- Breathing
  - PFM moves caudally during diaphragmatic inhalation – relaxation and elongation of the PFM occurs during descent of the respiratory diaphragm (Talaszi 2011)
  - Diaphragmatic breathing with EMG to encourage PFM relaxation
  - Gentle bearing down or other variations in breathing may also decrease resting tone (Benetti 2011)
- Counseling
  - Support groups, individual or partner counseling
  - Development of desire and arousal as patient restores the ability to tolerate penetration
- Treatment of dysfunctional voiding and defecation
  - Bladder retraining - start when pain is decreased, proceed slowly, 50% improvement in bladder pattern in patients with minimal IC pain (Parsons 1991)
  - Avoid constipation and the need for straining
  - Normalize fluid and fiber intake

### **PT Treatment of vulvodynia (Hartmann 2007)**

- 68% of women's health PTs in the US are in agreement on 9 treatment modalities:
  - Exercise
    - PFM exercises
    - Pelvic girdle exercise
    - Abdominal/lumbopelvic stabilization
  - MFR / soft tissue massage
    - Pelvic girdle muscles externally
    - Internal vaginal MFR of the PFM
    - Connective tissue of the pelvis
  - Bowel/bladder retraining
  - Eliminating vulvar skin irritants
  - Pelvic joint mobilization

**Call for more quality research** (Tu 2005, Palsson 2004, Frawley 2007, Hay-Smith 2002, Weijmar Schultz 2005)

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