PFM Rehabilitation for Physical Therapists and Nurses
The Northeastern Section of the American Urological Association
November 1, 2013
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Description - This 15 minutes lecture will provide information on the components of PFM strength, relaxation and coordination training for medical professionals.

Objectives
- Chose appropriate examination tools for PFM dysfunction
- List components of PFM strength training programs
- Describe PFM training principles used in patients with overactive PFM

PFM Rehabilitation
- Provided by medical professionals with training in the treatment of pelvic skeletal muscle dysfunction
- A part of the total treatment offered for urological dysfunction

Categories and treatment
- Underactive PFM - weakness = strength training
- Overactive PFM - spasm = relaxation training
- Dyssynergia / in-coordination - poor coordination and timing of PFM = coordination training

An accurate assessment of the PFM is necessary to develop successful PFM training programs - do not prescribe exercise programs only based on the diagnosis

Proper assessment of ability to contract the PFM is mandatory and affects the quality of interventions and the outcomes (Bo 2007)

Exercise prescriptions are based on results of the PFM examination (Clinical guidelines 2004)

Evaluation of the PFM
- Vaginal / rectal palpation
  - Underactive PFM = manual muscle test
    - Some disagreement as to the reliability and reproducibly of muscle grading (absent, weak, moderate, strong ) (Bo 2007, Messelink 2005)
    - Most experienced clinicians agree that digital palpation of the PFM contraction inside the vaginal canal is of great value in assessing the ability to perform a correct PFM contraction. (Bo 2007)
    - Vaginal palpation of the PFM contraction continues to be the gold standard for identifying a correct PFM contraction (Clinical guidelines 2004)
    - ICS terminology on PFM testing gives structure to the vaginal examination (Messelink 2005)
    - Moderate to substantial relaiablity in 10 out of 16 compents of the vaginal palpation assessment (Slieker-ten Hove 2009)
Overactive PFM
- No simple inclusive test
- Firmness and pain on palpation of the muscle should be further investigated
- Tone scales have been proposed but poorly accepted (Lukban 2002)

Pressure biofeedback
- Valid and reproducible
- Measures PFM closure pressure = underactive PFM
- Not able to evaluate increased resting tone or spasm - not used in overactive PFM

Surface electromyography (EMG)
- Good reliability, reproducibility, and significant clinical predictive validity
- Measures electrical activity of PFM with vaginal, rectal, or perianal sensors
- Useful in identifying underactive, overactive, and dyssynergia of the PFM
- Must have quality tracing especially for accurate assessment of overactive PFM

Real time Imaging Ultrasound
- Valid and reliable measurements
- Measures PFM muscle thickness
- Measures movement in response to PFM contraction and intra-abdominal pressure = underactive PFM
- Measures lack of relaxation and poor timing of contraction = overactive PFM and dyssynergia

Principles of training in patients with underactive PFM
- Clinical application (Bo 2007)
  - A strong structural support (stiff pelvic floor) may prevent descent of the bladder neck and urethra
  - Increased PFM endurance seems to be related to decreases in UI
  - Closes the urethra during abrupt increases in intra-abdominal pressure with an well-timed, quick and strong PFM contraction

Motor learning
- Specificity: perform the correct contraction, search, find, learn, control
- Overload: muscle must contract harder than it normally does in everyday activities, maximum intensity
- Progression: individualized for ability and increased as able
- Maintenance: program can be reduced but not terminated

“It is no longer a question of whether PFM training programs work but what components and combinations thereof are most effective” (Dumoulin 2011, Choi 2007, Bo 2011)

Components of PFM Strength Training Program
- Feedback
  - Verbal instruction of PFM contraction has been shown to be ineffective in generating urethral closure force in 51% percent of patients (Bump 1991) and results in adverse bearing down in approximately 15% of patients (Bo 1988)
  - Need to provide some sort of feedback: vaginal palpation, EMG, pressure biofeedback, or imaging ultrasound
- Number of seconds contraction is held – 5 to 10 seconds (Schabrun 2011, Bo 1999)
• Amount of rest between contractions – 5 to 10 seconds, adequate rest is necessary for successful training (Schabrun 2011)
• Number of repetitions – gradually increase, at least 24 contractions per day (Choi 2007)
• Number of times repeated during the day – 2 to 3 sets per day especially if the muscle is very weak
• Patient position - supine, sitting, standing (Borello-France 2006)
• Intensity (Johnson 2001, Bo 1999)
• Resistive exercises - Vaginal weights – no significant benefit over PFM exercise alone (Herbison 2008, Bo 1999, Castro 2008)
• Frequency of visits - supervised PFM training more than 2 times per month is more effective (Dumoulin 2011)
• Group versus intensive / individual training - (Hay-Smith 2004, Janssen 2005, Bo 1990)
• Adherence – significant predictor of success (Alewnjse 2007, Dumoulin 2011)
• Length of training period – at least 6 to 8 weeks (Dinubile 1991, Choi 2007)
• Maintenance - one set of 8-12 intense contractions 2 to 7 times per week (Pollock 1998, Hayn 2000)

Principles of PFM training in patients with overactive PFM
• Aggressive PFM strengthening usually increases pain and dysfunction in patients with overactive PFM
• Relaxation or down training initially helps to restore normal muscle tone, increase circulation in the muscle and decrease pain
• Biofeedback to facilitate isolation of contraction/relaxation of PFM – with the focus on relaxation first can be helpful in decreasing overactive PFM and pain (Doggweilier-Wiygul 2004, Lubkan 2002, Bassotti 2004, Heah 1997)

Possible treatments for Overactive PFM
• General relaxation training - autosuggestion, visualization
• Diaphragmatic breathing
• Contract relax - combined with EMG relaxation training
• Perineal bulging
• Vaginal / rectal dilator insertion - combined with EMG training for more learning
• Manual therapy
  o Internal vaginal / rectal massage of the PFM
  o Treatment of sacroiliac or pubic symphysis joint dysfunction
• Modalities
  o Heat / ice
  o Electrical stimulation - TENS, intravaginal / intrarectal
  o Ultrasound
• Patient education
  o Posture
  o Skin care
  o Relaxation and stress management
  o Physiology of pain or urgency
Dyssynergia / in-coordination

- Co-contraction of PFM and Abdominal Muscles - Tranversus Abdominus contraction (Junginger 2010)
- Response of the PFM to intra-abdominal pressure - the Knack (Miller 1998)
- Paradoxical PFM contraction - obstructed defecation (Battaglia 2004)
- Overflow /facilitation – adductors, abductors, external rotators of the hip (Dumoulin 2011, Culligan 2010)
- Synergy of the PFM and Respiration - contract on exhale and avoid bearing down (Miller 1998, Hodges 2007, Junginger 2010)

Resources for further learning in conservative management
International Continence Society – support and education for professionals in the field of continence http://www.icsoffice.org


References


Janssen CC, Lagro-Janssen AL, Felling AJ. The effects of physiotherapy for female urinary incontinence: individual compared with group treatment. *BJU Int.* 2001;87:201-6


