International Continence Society Annual Meeting
Barcelona, Spain August 27, 2013

Workshop #30 Conservative Management of adult pelvic floor dysfunction: a physiotherapy approach.

(Definitions and Physical Therapy Role in Conservative Management of Urinary Incontinence (UI) and Pelvic Organ Prolapse (POP), Anatomy and function of the PFM, Manual assessment of the PFM)

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Type of pelvic floor dysfunction (Haylen 2009) ICS / IUGA standard terms

- Stress urinary incontinence (SUI): the complaint of involuntary loss of urine on effort or physical exertion (as in sports activities), or on sneezing or coughing.
- Urgency urinary incontinence (UUI): the complaint of involuntary loss of urine associated with urgency
- Nocturia: the complaint of interruption of sleep one or more times because of the need to urinate. Each void is preceded and followed by sleep.
- Urgency: the complaint of a sudden compelling desire to pass urine, which is difficult to defer
- Overactive bladder syndrome (OAB): urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence, in the absence of urinary tract infection or other obvious pathology.
- Mixed urinary incontinence (MUI): the complaint of involuntary loss of urine associated with urgency and also with effort or physical exertion or on sneezing, or coughing
- Pelvic organ prolapse (POP): descent of one or more of the: anterior vaginal wall, posterior vaginal wall, uterus (cervix), apex of the vagina.
    - Uterine / cervical prolapse
    - Vaginal cuff prolapse
    - Anterior wall prolapse - cyctocele
    - Posterior wall prolapse - rectocele

Types of pelvic floor muscle (PFM) dysfunction (Messelink 2005)

Normal PFM

- PFM is able to contract and relax on command and in response to increased intra-abdominal pressure as appropriate
- Resulting in normal urinary, bowel, and sexual functioning
- Measured by strong or normal voluntary and involuntary PFM contraction and complete PFM relaxation

Underactive PFM

- PFM is unable to contract sufficiently or when needed - weakness
- Resulting in urinary or fecal incontinence, or pelvic organ prolapse
- Measured by absent or weak voluntary and involuntary PFM contraction

Overactive PFM

- PFM is unable to relax and may contract during functions such as defecation or micturition - muscle spasm
- Resulting in obstructive voiding or defecation, dyspareunia, or pelvic pain
- Measured by absent or partial voluntary PFM relaxation

Possible conservative treatments of underactive PFM, UI and POP

- PFM exercises: with or without biofeedback (Choi 2007, Hay-Smith 2004, Dumoulin 2008, Bo 2011, Hagen 2011)
- PFM coordination with the abdominals and trunk muscles (Critchley 2002)
    - Reducing exacerbating activities ï improve lifting habits and exercise technique
- Bladder training (Wallace 2009, Dougherty 2002, Shamliyan 2008, Alhasso 2009)
    - Fluid modifications for OAB
        - Inconsistent results of the relationship of caffeine to OAB, but is does appear decreasing caffeine can decrease UI in some (Milne 2008, Wyman 2009)
        - Decreasing fluid intake by 25% significantly decreases frequency, urgency, and UI in patients with OAB (Milne 2008) ï even more than decreasing caffeine
- Electrical stimulation ï inconsistent evidence (Berghmans 2007, Shamliyan 2008)
- Functional mobility - as needed in patients with physical disability
    - Gait and balance training
    - Removal of environmental barriers
    - Avoid falls related to rushing to the bathroom especially at night (Guelich 1999, Brown 2000, Teo 2006, Takazawa 2005, Parsons 2009)
- Lifestyle interventions
    - Generalized exercise program can decrease UI especially in sedentary patients and those with cold intolerance (Inoue 2012)
    - Smoking (Wyman 2009)
        - Increase intra-abdominal pressure with coughing contributes to SUI
        - Nicotine has been shown to induce increased bladder activity in cats
        - Smoking cessation can decrease UI and urgency in men
    - Obesity (Milne 2008)
        - Body Mass Index over 30 is an independent risk factor for OAB in women and UI in older males (Teleman 2004, Milne 2008, Wyman 2009)
        - Weight loss significant decreased UUI (Subak 2005)
    - Constipation (Wyman 2009, Pearson 1992)
        - Prevalence of constipation directly related to UI in geriatric patients
        - Higher rates of constipation in men and women with OAB
        - Resolution of constipation significantly improves urgency and frequency in older patients (Charach 2001) and children
    - Collection and containment ï pads, diapers

Pelvic floor muscle anatomy
Pelvic ring - 2 ilium, and sacrum
- Pubic arch
- Ischial tuberosity
- Ischial spine

Associated muscles of the pelvis
- Synergistic muscles (Bo 1994) ï Adductors, Tranversus abdominus, Gluteals
- Muscles in close proximity ï Piriformis, Obturator internus
- Inner core muscles ï (Lee 2004) Tranversus abdominus, multifidus, respiratory diaphragm, pelvic floor muscles (PFM)

External perineum
- Anal triangle
- Urogenital triangle ï female
  - Intriotus - entrance to the vagina
  - Urethral meatus - entrance to the urethra
  - Perineal body - connective tissue central attachment for perineal muscles

Layers of the PFMs ï a combination of slow twitch and fast twitch skeletal muscles
1. Anal sphincters
2. Superficial genital muscles
   - Superficial transverse perineal
   - Bulbocavernosus
   - Ischiocavernosus
3. Perineal membrane
   - Compressor urethrae
   - Urethrovaginal muscle
4. Sphincter urethrae
5. Pelvic diaphragm (Kerney 2004)
   - Levator ani muscles
     - Pubococcygeus (pubovisceral)
     - Puborectalis
     - Iliococcygeus
     - Coccygeus (ishiococcygeus)

The role of the pelvic floor muscle (PFM) in continence
- Clinical experience in decreasing UI with PFM training (Kegel 1948)
- Original framework of modern theories incorporates the role of the support ligaments and the support of the PFM (Wall and DeLancey 1991, DeLancey 1993)
- Multiple basic science studies have contributed to a more clear understanding of the role of the PFM in UI (mechanism summarized well in Ashton- Miller 2007)
  - Contraction at the correct time
    - Improvement of voluntary contraction of the PFM before increases in intra-abdominal pressure (Bo 2007)
    - Close the urethra during abrupt increases in intra-abdominal pressure with a well-timed, quick and strong PFM contraction (Bo 2007) - the Knack

    - Support and closure
        - Elevate the resting position of the bladder and rectum (Hoff Brækken 2010)
        - A strong structural support (stiff pelvic floor) may prevent descent of the bladder neck and urethra and helps maintain urethral closure (Ashton-Miller 2007, Bo 2007)
        - Increase PFM volume and shorten PFM length (Hoff Brækken 2010)
        - Maintain urethral hiatus closed (Ashton-Miller 2007, Hoff Brækken 2010)
- After many well done RCTs and systematic reviews ï evidence of decreased symptoms after PFM exercises
    - Comparing PFM training to no treatment (Dumoulin 2011)
    - Women who were treated were 17 times more likely to report cure or improvement
    - Were 5 to 16 times more likely to be continent on pad test
- ñIt is no longer a question of whether PFM training programs work but what components and combinations thereof are most effectiveò (Dumoulin 2011)

Important of evaluation and assessment of PFM function
- 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)
- Proper assessment of ability to contract the PFM is mandatory and affects the quality of interventions and outcomes (Bo 2007)
- Exercise prescription is based on results of PFM examination (Clinical guidelines 2004)

Conservative examination of PFM function (Bo 2005)
- Real-time Imaging ultrasound
- Surface electromyography (EMG)
- Pressure biofeedback
- Manual assessment of the PFM

Manual assessment of the PFM (Bo 2007, Haslam 2008)
External observation
- Supine with knees bent (hook lying)
- Watch the perineal body while patient attempts to contract the PFM - "holding back gas" (Crotty 2011), lifting up and inward
- Normal elevation of PFM by MRI is 10.8 mm (Bo 2011) and by ultrasound is 11.2 mm (Bo 2003)
- There is fairly good agreement among observers in assessing (Slieker-ten Hove 2009)
    - Correct contraction - movement of perienal body toward the head
    - No movement
    - Straining - movement of perienal body toward the feet, buldging outward
- External observation can give preliminary information about ability to contract PFM but should be followed with internal assessment if possible

Vaginal palpation

- Some disagreement as to the reliability and reproducibly of muscle grading (absent, weak, moderate, strong or 0/5 to 5/5)
- Most experienced clinicians agree that digital palpation of the PFM contraction is of great value in assessing the ability to perform a correct PFM contraction.
- This continues to be the gold standard for identifying a correct PFM contraction (Clinical guidelines 2004)
- ICS terminology on PFM testing from the pelvic floor clinical assessment group (Messelink 2005) gives structure to the vaginal examination
- Procedure
    - After a comprehensive history and review of symptoms, explain examination to the patient and obtain informed consent
    - Set up the examination area - privacy, treatment table, sheet, gown, pillow, gloves, lubricating gel, and tissue. No speculum is used
    - Patient is positioned in hook lying (most therapists do not use stirrups) with perineum exposed
    - Therapist usually stands to the side of the patient
    - Put gloves on and place a small amount of lubricating gel on the tip of the index finger
    - Gently part the labia minora with non dominant hand and insert index finger to the second knuckle
    - Touch the PFM on the right and ask the patient if she has pain. Notice the thickness and tone of the muscle. Repeat on the opposite side.
    - Insert a second finger if able and ask the patient to contract the PFM. Notice closure and lift as well as how long she can hold the contract.
    - Therapist should also observe trunk and legs for excessive overflow contraction, bearing down and breath holding.
    - Have the patient relax the muscle fully and then repeat the holding contraction, assessing how many contractions can be repeated.
    - More complex examination techniques may be learned.

Precautions /contraindications for internal vaginal PFM examination

- Absolute contraindications
    - Active infectious lesions (eg, genital herpes)
    - Active infections of the vagina or bladder
    - Absence of patient agreement or cognitive understanding of the procedure
    - Absence of previous pelvic exam (pediatric)
    - Inadequate training on the part of the PT to perform the exam
    - Menses is NOT necessarily a contraindication
- Experienced therapists can perform the examination with permission from the physician:
    - Pregnant
    - Immediately post-partum (up to 6-8 weeks)
    - Immediately post-vaginal surgery (up to 6-8 weeks)
    - Immediately post-pelvic radiation treatment

- Use caution and monitor patient response
  - Severe atrophic vaginitis
  - Severe pelvic pain
  - History of sexual abuse

Prognostic indicators of poor success with physiotherapy for SUI (Hendricks 2010)

- Severe SUI
- POP stage greater then 2 - organ is almost outside the vagina
- Poor outcome in previous PT
- Second stage of labor (pushing) longer than 90 minutes
- Body Mass Index greater than 30 - obesity
- High psychological stress
- Self-report of poor physical health

How do you Choose Appropriate Intervention?

- Each treatment approach will have indications and contraindications
- A through intake and examination will direct treatment choices - weight loss, smoking cessation, gait or transfer training, fluid modification, constipation treatment
- Every patient should receive an individualized
  - Bladder schedule
  - PFM exercise program
  - Functional PFM training: body mechanics, co-contraction of the abdominals
- Patient with POP should be taught to avoid excessive increased in intra abdominal pressure such as constipation and poor lifting
- Some treatments require extra expense for the clinic or patient and may direct choices
- Ambulatory continence PT provided effective and low-cost treatment for women with SUI and should be routinely implemented as first-line treatment before consideration of surgery (Neumann 2005)

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