W2: The Overactive Pelvic Floor

Workshop Chair: Anna Padoa, Israel
13 September 2016 09:00 - 12:00

Start	End	Topic	Speakers
09:00	09:15	Definitions and pathophysiology of OPF.	Marc Beer Gabel
09:15	09:35	Bladder Pain Syndromes, Chronic Pelvic Pain, Voiding dysfunction and OPF.	Mauro Cervigni
09:35	09:55	Role of the pelvic floor in sexual function. Sexual pain disorders.	Anna Padoa
09:55	10:10	Gastrointestinal co-morbidities and OPF. Marc Beer-Gabel, MD	Marc Beer Gabel
10:10	10:30	Evaluating and understanding pelvic floor muscle overactivity- A physiotherapist perspective.	Melanie Morin
10:30	11:00	Break	None
11:00	11:15	Sexual Abuse, other psychosocial factors and OPF.	Anna Padoa
11:15	12:00	Discussion	All

Aims of course/workshop

1. To understand the definition, pathophysiology and clinical presentation of an overactive pelvic floor (OPF) and its relation to chronic pain conditions and psychosocial issues.
2. To carry out the evaluation of patients with OPF using a multidisciplinary approach and to become acquainted with common diagnostic techniques and tools.
3. To plan an individually tailored treatment strategy for patients suffering from OPF and OPF-related conditions.

Learning Objectives

After this workshop participants should be able to:

1. To understand the definition, pathophysiology and clinical presentation of an overactive pelvic floor (OPF) and its relation to chronic pain conditions and psychosocial issues
2. To refine the ability to carry out the evaluation of patients with OPF using a multidisciplinary approach and to become acquainted with common diagnostic techniques and tools
3. To plan an individually tailored treatment strategy for patients with OPF and OPF-related conditions

Learning Outcomes

After this seminar, attendees will be able to identify OPF patients in the course of their clinical practice. Attendees will learn how to carry out basic screening for possible co-morbidities and psychosocial risk factors. The course will provide attendees with the tools needed to initiate workup and to plan treatment, including possible interdisciplinary referral. Each attendee will be able to establish a network of professionals in their geographic location, in order to address all aspects of OPF, though a coordinated team approach. After the course, attendees will be able to spread knowledge and increase awareness on OPF in their community of patients and colleagues. We hope the course will also stimulate attendees to initiate further research on OPF and OPF-related conditions.

Target Audience

Coloproctologists, continence nurses, gastroenterologists, gynecologists, midwives, physiotherapists, sexologists, sex therapists, urogynecologists, urologists

Advanced/Basic

Advanced

Conditions for learning

This is a seminar based on presentations delivered by the speakers. An interactive discussion will be taking place during the last 45 minutes, including a clinical case discussion. Time will be dedicated to Q&A at the end of each presentation.

Suggested Learning before workshop attendance

http://www.springer.com/in/book/9783319221496

Suggested Reading

- Simons, D. G. and S. Mense (1998). "Understanding and measurement of muscle tone as related to clinical muscle pain." Pain 75(1): 1-17.

- Gajdosik, R. L. (2001). "Passive extensibility of skeletal muscle: review of the literature with clinical implications." Clin Biomech 16: 87-101.

- Weijmar Schultz W, Basson R, Binik Y, Eschenbach D, Wesselmann U, Van Lankveld J. Women's sexual pain and its management. J Sex Med 2005; 2: 301–16

- Yehuda R, Lehrner A, Rosenbaum TY. PTSD and Sexual Dysfunction in Men and Women. J Sex Med. 2015 May; 12(5): 1107-19.

- Goldstein A. Moving beyond the diagnosis of vestibulodynia" A holiday wish list. 2009;3227–9

- Homma Y, Ueda T, Tomoe H et al. Clinical guidelines for interstitial cystitis and hypersensitive bladder syndrome. Int J Urol 2009; 16:597–615.

- Butrick CW: Pelvic floor Hypertonic disorders: identification and amanagement. Obstet Gynecol Clin North Am 2009; 36: 707-722

- FitzGerald MP, Kotarinos R.Rehabilitation of the short pelvic floor. I: Background and patient evaluation.Int Urogynecol J Pelvic Floor Dysfunct. 2003 Oct; 14(4):261-8

- Wald A, Bharucha AE, Cosman BC, Whitehead WE. ACG Clinical Guideline: Management of Benign Anorectal Disorders Am J Gastroenterol 2014; 109:1141–1157

- Beer-Gabel M, Carter D. Comparison of dynamic transperineal ultrasound and defecography for the evaluation of pelvic floor disorders. Int J Colorectal Dis. 2015 Mar 31.

- Wald A: Functional anorectal and pelvic pain .Gastroenterol Clin Noth Am 2001;30:243-51

Marc Beer Gabel. MD

Definitions and pathophysiology of OPF

Pelvic Floor Overactivity (OPF) is a condition in which pelvic floor muscles do not relax, or may even contract when relaxation is functionally needed, like during micturition or defecation. In this chapter, we will overview pelvic floor anatomy and physiology. Pelvic floor muscles support the pelvic organs and are involved in continence, evacuation and sexual activity, constituting a complex functional entity. They affect pelvic organ function and interact with other core and hip muscles, affecting spinal stability, body posture and breathing. Pelvic floor muscles are connected to the fascia and activated by the somatic and autonomic nervous systems. As such, they are both under unconscious and voluntary control, which both determine pelvic floor tonus, which is enhanced in the case of OPF. Such tonus can be affected by abnormal body posture, emotions, memories and physical or psychological trauma.

At the neuromuscular junction, excessive release of acetylcholine, injury to the sarcoplasmic reticulum and ionic calcium release can causes contraction of the sarcomere, thus leading to hypertonicity.

Upon palpation, trigger points can be demonstrated as sensitive spots in skeletal muscles, associated with distinct nodules in taut bands of muscle fibers extending from a trigger point to the muscle attachments.

OPF interplays with various dysfunctions of the urological and colorectal system and may impair sexual function. Dysfunction may be associated with pain when there is persistent overactivity and the muscles shorten, influencing local circulation and causing ischemia.

Take home message: The pelvic floor is an integral functional unit including visceral and muscular elements, which interact both in the normal and dysfunctional state. Evaluation and treatment of pelvic floor dysfunction needs to address both elements in order to achieve efficacy.

Gastrointestinal Comorbidities: The Role of Pelvic Floor Overactivity on Defecation

The aim of this presentation is to acknowledge OPF as a cause of impaired defecation and chronic pelvic pain and to recognize its relation to psychosocial stresses. The use of diagnostic tools, such as anorectal manometry, ultrasound and defecography will be reviewed.
We will review the mechanism of normal defecation. Synchronization between the feeling the need to defecate, contraction of the hindgut and pelvic floor muscle relaxation is essential to allow rectal evacuation.
When pelvic floor muscles become overactive, normal coordination between contraction and relaxation is disturbed, leading to bowel disorders. If this persists, muscles will shorten and become tense. A vicious cycle can involve contraction of abdominal muscles trying to overcome the non-relaxing contracted puborectalis during strain. Shortening of the muscle and impaired relaxation can cause pain or discomfort. Unfortunately, muscle overactivity can persist without the patient being aware of tense

muscles or abdominoperineal lack of coordination, so that defecation becomes obstructed and painful. We will discuss the place of anorectal manometry and Xray defecography as evaluation and patient education tools. We will overview the use of ultrasound defecography as a novel, non-ionizing office examination, which can serve as a first line evaluation tool. Finally, we will discuss treatment, with special emphasis to the use of physiotherapy and biofeedback. We will suggest medical treatment options for chronic myofascial pain.
Take home message: Bowel dysfunction is frequently encountered in OPF patients. Health providers treating OPF should be routinely screening patients for lower GI function and should be familiar with common diagnostic tools used for GI evaluation.

Mauro Cervigni, MD
Bladder Pain Syndromes, Chronic Pelvic Pain, Voiding dysfunction and OPF.

Overactive Pelvic Floor (OPF) is a clinical condition that affects a prominently female population, given the peculiarities of the female pelvic anatomy. There are many causes considered to be responsible for this particular clinical situation, among which Bladder Pain Syndrome (BPS) plays an important role. This condition is characterized by chronic inflammation of the bladder and is associated with Chronic Pelvic Pain (CPP). Diagnosis is typically established late in the course of disease, when the chronic neurogenic inflammatory state often affects adjacent pelvic organs and structures: uterus, vagina, rectum, gastrointestinal tract and pelvic floor muscles. BPS patients very frequently present spastic and hypertonic pelvic floor associated with pronounced tenderness upon palpation of specific trigger points. Isolated treatment of the latter, or selectively addressing muscle tone, mostly achieve a partial or minimal therapeutic response. Once the coexistence of BPS has been identified in a patient suffering from OPF, bladder inflammation and pain should be treated at once, while concurrently or subsequently addressing hypertonus of the pelvic floor. Once the painful and inflammatory component of the bladder is improved, partial or complete resolution of muscle hypertonicity occurs in 50-60% of cases. Therefore, it is mandatory for a specialist treating OPF patients to be able to detect the presence of BPS and either address its evaluation and treatment or refer the patient to specialized centers for an optimization of the clinical response resulting in improved patients quality of life.

Take home message: at the end of the presentation, participants will be able to recognize the possible coexistence of BPS in OPF patients, thus allowing comprehensive treatment or appropriate referral to specialized centers.

Mélanie Morin, PT, Ph.D
Evaluating and understanding pelvic floor muscle overactivity - A physiotherapist's perspective

It has been recognized that pelvic floor muscle (PFM) overactivity plays a crucial role in several conditions such as bladder and bowel elimination disorders, genital/pelvic pain syndromes and sexual dysfunctions.

This presentation will review the muscle physiology associated with PFM tone. General muscle tone can be defined as the resistance provided by the muscle when pressure or a stretch is applied. General muscle tone in normally innervated skeletal muscles is composed of a passive and an active component (Simons, 2008). The passive component consists of the viscoelastic properties of the muscle tissue (Gajdosik 2001). The active component consists of physiological contracture (commonly defined as trigger point (TP)), electrogenic spasms (unintentional muscle contraction that can be brought to voluntary control), and normal electrogenic contraction (resting activity in normally relaxed muscle and myotatic reflex during stretching).

The presentation will also discuss the current assessment tools (palpation, ultrasound, manometry, electromyography (EMG) and dynamometry) and relate these tools to muscle physiology for evaluating muscle tone. Moreover, their psychometric properties (validity and reliability) and current recommendations will be presented.

The available evidence in women and men with conditions related to an overactive PFM will be discussed. So far, the literature suggests an elevated global PFM tone (measured by ultrasound, dynamometry and manometry), TPs (measured by palpation and palpometer), increased viscoelastic properties (dynamometer and EMG) and for some patients, elevated tone explained by electrogenic causes (evaluated by EMG). Empirical findings also indicate that the assessment of PFMs should not be limited to tone since the contractile properties (strength, speed of contraction, control and endurance) were also shown to be altered.

The evidence concerning the efficacy of PFM physiotherapy modalities will be presented. Physiotherapy intervention may include different modalities (education, manual therapy, biofeedback, electrical stimulation and dilator) which may target different components of PFM tone. For instance, biofeedback specifically addresses electrogenic spasms. The patients can thus learn how to properly relax their PFMs and gain control. In contrast, muscle stretching may address reduced flexibility associated with the viscoelastic properties of the tissue.

Take home message: A thorough understanding of PFM assessment tools in relation to muscle physiology is crucial to guide in the selection of treatment modalities and hence, potentiate efficacy.

Anna Padoa, MD

Role of the pelvic floor in sexual function. Sexual pain disorders.

Sexual dysfunction is possibly the most common presentation of an overactive pelvic floor, especially in female patients.
This presentation will start with an overview of the role of pelvic floor muscles in normal female sexual function. The evidence on the effect of pelvic floor muscle training on sexual function in women with normal pelvic floor muscle tone will then be addressed.

We will review the classification, pathophysiology, clinical presentation and treatment of female genito-pelvic pain and penetration disorders, with special emphasis on the relation between sexual pain, sexual arousal and pelvic floor muscle tone.
The role of the pelvic floor in male sexual function will be overviewed, in relation to chronic pelvic pain and chronic prostatitis.
We will then discuss pelvic floor overactivity in relation to several sexual, emotional and relationship issues. Evidence regarding the response of pelvic floor muscles to stress will be reviewed. A special emphasis will be devoted to post traumatic stress disorder in sexual abuse survivors, as a cause for pelvic floor overactivity. Attachment styles and other behavioural issues and their relation the pelvic floor will also be mentioned.

In the section regarding treatment of overactive pelvic floor, this presentation will focus on psychological and medical therapy. We will suggest that health care providers adopt some cognitive therapy tools from interpersonal practice when treating patients with an overactive pelvic floor, given the significant role of psychosocial factors in causing and maintaining such conditions.

Medical and surgical treatment for genital pain disorders will be overviewed. We will suggest a treatment strategy based on selecting specific therapeutic tools according to the most probable etiology of the condition in each patient: hormonally mediated, neuroproliferative or mainly OPF-related.

Take home message: Pelvic floor overactivity, genito-pelvic pain disorders and psychosocial stresses are interrelated and mutually causative conditions, connected to each other through a vicious cycle. Acknowledging this fact is crucial both for health care providers and OPF patients in order to achieve treatment success.

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ICS 2016
WS # 2 – The Overactive Pelvic Floor

Bladder Pain Syndrome, Chronic Pelvic Pain, Voiding Dysfunction & Overactive Pelvic Floor

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Chronic Pelvic Pain

ANATOMICAL CLASSIFICATION OF PELVIC PAIN SYNDROMES

- **UROLOGICAL:** *Painful bladder syndrome/Interstitial Cystitis*
  Urethral pain syndrome
  *Penile pain syndrome**
  Prostate pain syndrome
  Scrotal pain syndrome
- **GYNAECOLOGICAL:** *Endometriosis-associated pain syndrome*
  Vaginal pain syndrome
  Vulvar pain syndrome

EAU guidelines 2007

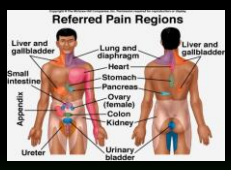
European Association of Urology - EAU

ANATOMICAL CLASSIFICATION OF PELVIC PAIN SYNDROMES II

- **ANORECTAL:** *Proctalgia fugax*
  *Anorectal pain syndrome **
  Anismus
- **NEUROLOGICAL:** *Pudendal pain syndrome **
- **MUSCULAR:** *Perineal pain syndrome*
  *Pelvic floor muscle pain syndrome **

EAU guidelines 2007

Chronic Pelvic Pain



It's a visceral pain and as such it is difficult to interpret correctly

Chronic burning pain,
distributed in the perineum (ano-rectal and / or urogenital);
worse from sitting

Chronic Pelvic Pain

PAIN LOCALIZATION

Pats with urogenital pain suffer from "more than one pain"

In women	In men
lower abdomen (80.4%)	testicles (68%),
urethra (72.8%)	penis (29%),
lower back (65.7%)	anus / rectum (39%)
vaginal area (51.5%)	

Simon L.J, 1997

The Bladder Is the Source of CPP in Over 30% of Female Patients[1]

Visceral Sources of Pelvic Pain[2]

- Reproductive causes are the source of CPP in only 20% of patients[1]

1. Zondervan KT et al. Br J Obstet Gynaecol. 1999;106:1156-1161.
2. Howard FM. Obstet Gynecol. 2003;101:594-611.

European Society for the Study of IC/PBS
Bladder Pain Syndrome - Painful Bladder Syndrome - Interstitial Cystitis

ESSIC Definition

Bladder Pain Syndrome

pain related to the urinary bladder, accompanied by at least one other urinary symptom such as day-time and night-time frequency, exclusion of confusable diseases as the cause of the symptoms and cystoscopy with hydrodistention and biopsy if indicated

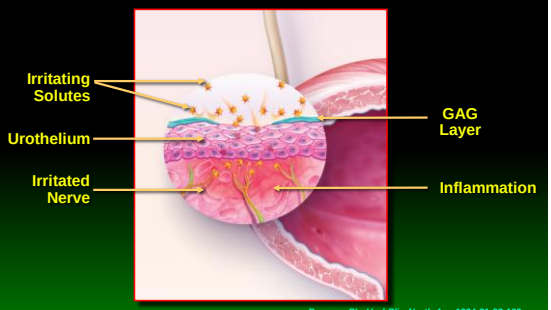
Interstitial Cystitis/ Bladder Pain Syndrome (IC/BPS)

is a gender disease !

Pathogenesis of BPS/IC

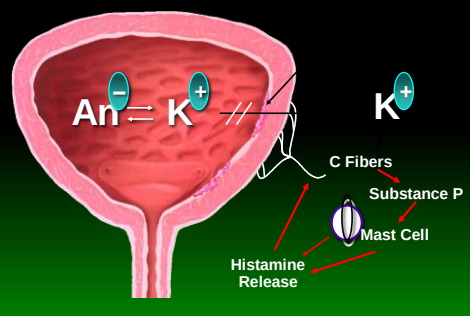
- Role glycosaminoglycans (GAG's)
- Mast cells (bladder mastocytosis)
- Neurogenic inflammation

Role of GAG Layer in IC: Defective Urothelial Barrier

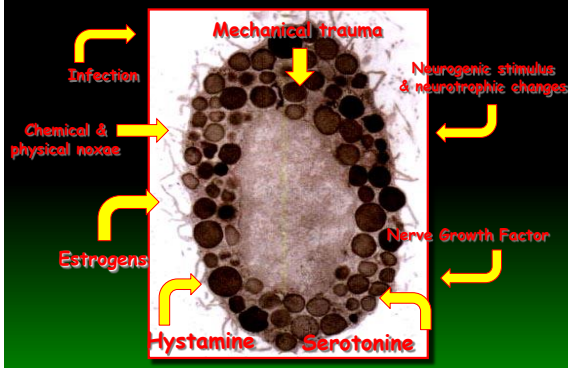


Parsons CL. *Urol Clin North Am.* 1994;21:93-100.

GAG Dysfunction and Sensory Hyperstimulation

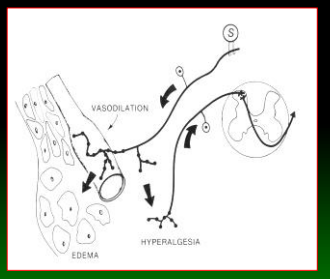


Mast Cells activation



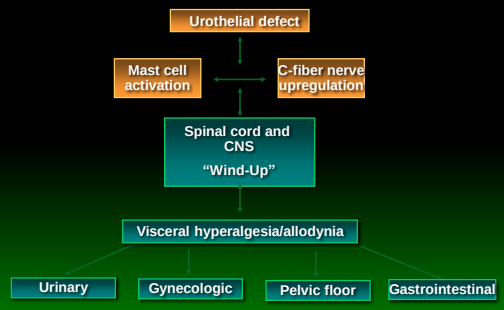
Neurogenic Inflammation

- Antidromic firing
  - release of NGF and substance P
  - mast cells release histamine
  - altered membrane permeability

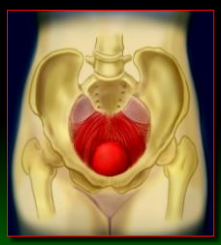


Fields

Interstitial Cystitis Pathogenesis: Integrated Pathophysiology



Pelvic Floor Spasm in IC/CPP



- Bladder inflammation
- Pelvic floor dysfunction

Pelvic Floor Dysfunction

- Non-neurogenic detrusor-sphincter dyssynergia
- Present in 70% of IC/BPS patients
- Probably the same or very similar to CP/CCPS Category IIIB

Pelvic Floor Dysfunction

Symptoms

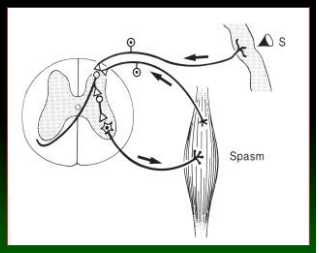
- Pelvic Pain
- Urinary urgency and frequency
- Pain with sexual intercourse or orgasm
- Variable urinary flow rate
- Constipation
- Lower back pain

PBS/IC Cystitis and Pelvic Floor Dysfunction

IC/BPS	PFD
•Urgency and frequency of urination	•Urgency and frequency of urination
•Pelvic pain	•Pelvic pain
•Dyspareunia common	•Dyspareunia common
•Symptoms often worsened by stress	•Symptoms often worsened by stress
•Nocturia common	•Nocturia uncommon
	•Sensation of incomplete emptying
	•Constipation
	•Low back pain
	•Straining with voiding

Viscero-Muscular Reflex

- Guarding is an example
- Pelvic floor hypertonus
  - Associated voiding dysfunction and incontinence
  - Myofascial pain/triggers
  - Dyspareunia
- New pain generator

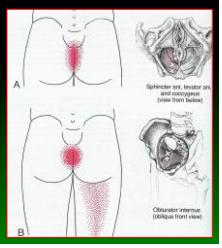


Fields

Pelvic Floor Muscles

Referred pain:

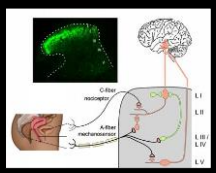
- **Perineum**
- **Urogenital structures (vagina/base of penis)**
- **Anus (Proctalgia fugax)**
- **Tailbone**
- **Hip**
- **Low back**
- **thigh**



Pelvic Pain

acute

- Sign of tissue damage
- Conjunction response
- autonomic reflex and signs
- inflammation and infection



chronic

- Usually dysfunction of neuronal circuits painkillers and no sign of organ pathology
- Cause of stress for the individual affected with physical and psycho-social
- Featuring answers psychological, emotional and behavioral differ from acute pain

the pain becomes the disease

Neuropathic pain

IASP

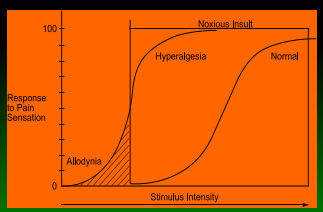
Spontaneous pain independent of stimuli (symptoms described by the patient)

burning pain continuous Intermittent pain a dense, throbbing, electric shock, crampy

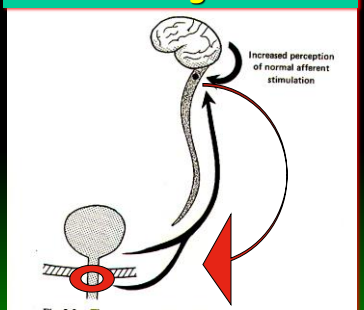
Pain caused by stimuli (product by physical examination)

Hyperalgesia

Allodynia

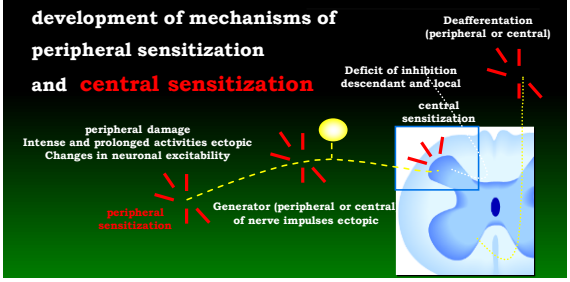


LUT pain induced changes



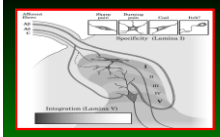
Genesis of chronic pain

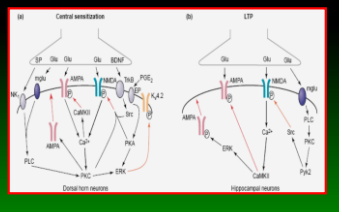
The pivotal moment that marks the transition from acute pain to chronic pain is the development of mechanisms of peripheral sensitization and central sensitization



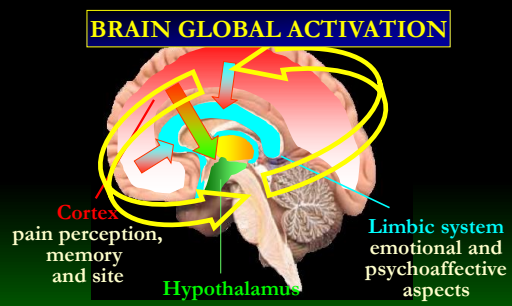
Central Mechanism: Wind-Up phenomenon

When the fibers C are kept active by a stimulus sustained high frequency, the response of neurons broad-spectrum dynamic increases progressively to each stimulus





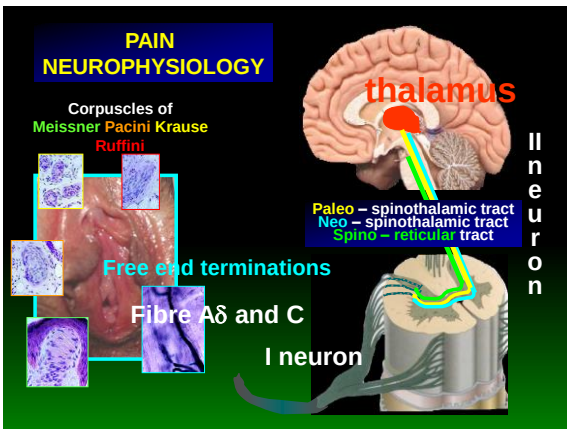
PAIN CEREBRAL CONNECTIONS



Assessment of Pelvic Floor

- Observation of vulva
- Width of introitus
- Palpation for tenderness
- Muscle tone
- Presence of trigger points
- Muscle strength
- Neuromuscular control

PAIN NEUROPHYSIOLOGY



High Tone Pelvic Floor

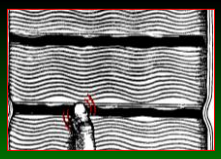
Characterics of High tone:

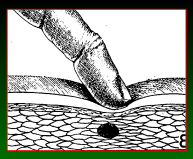
- Hypertonicity
- Decreased strength
- Decreased ability to relax post contraction
- Pain to palpation
- Trigger points
- Decreased motor control

Internal Assessment

Trigger Point:

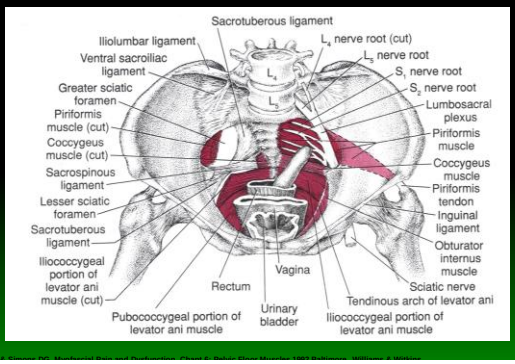
A discrete, focal, hypersensitive spots located in a taut band of skeletal muscle. They produce pain locally and in a referred pattern and often accompany chronic musculoskeletal disorders.



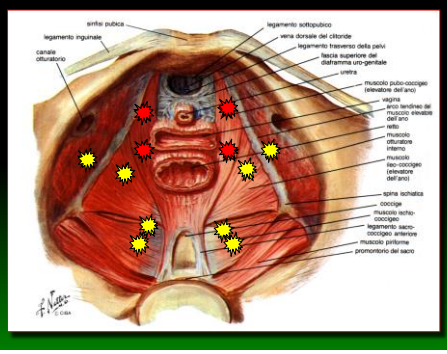


Travell, Janet; Simons David; Simons Lois (1999). *Myofascial Pain and Dysfunction: The Trigger Point Manual (2 vol. set, 2nd Ed.).* USA: Lippincott Williams & Williams

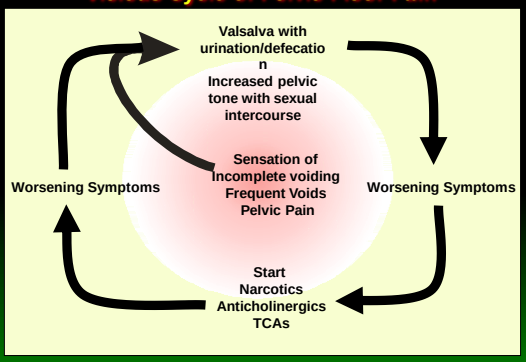
Pelvic floor manual assessment: transvaginal or transrectal



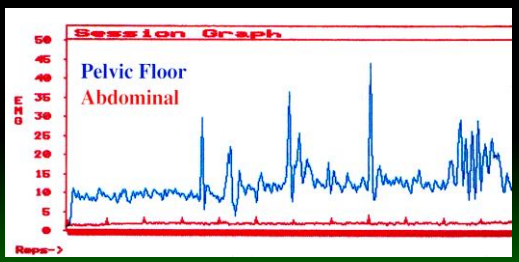
Myofascial Trigger Points



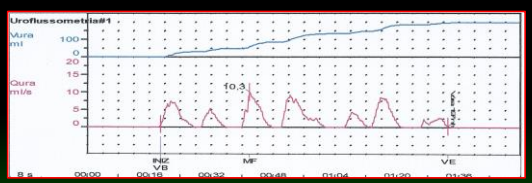
Vicious Cycle of Pelvic Floor Pain



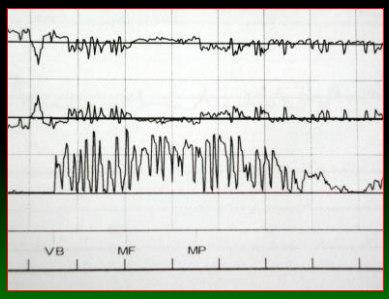
Muscle Tone: hypertonic, spastic



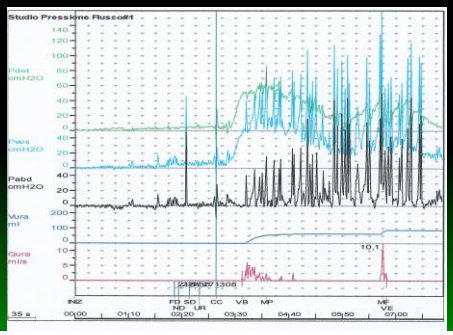
UDM & IC/BPS INTERRUPTED UROFLOW



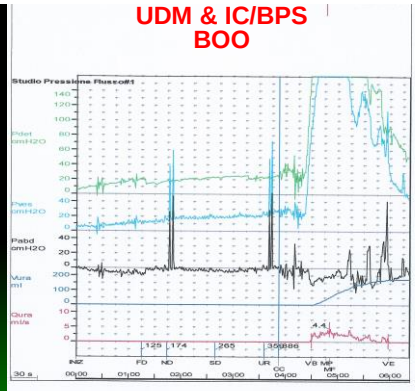
PELVIC FLOOR DYSFUNCTION
UROFLOW



UDM & IC/BPS
BOO



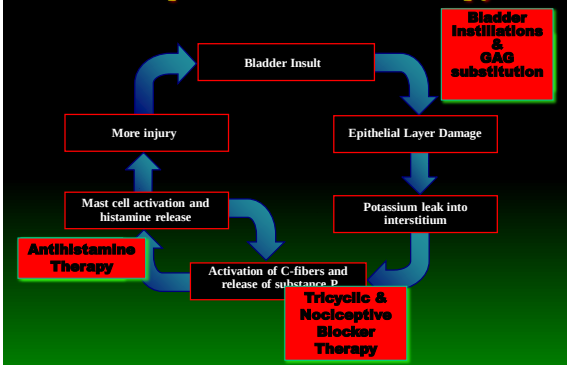
UDM & IC/BPS
BOO



An undefined problem has an infinite number of solutions.

Robert A. Humphrey

Principles of BPS/IC Therapy

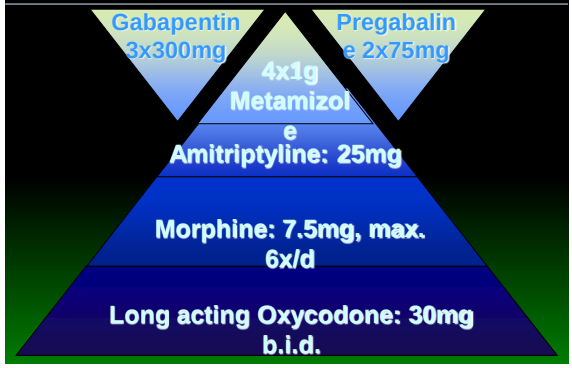


Oral Treatment - GoR

Treatment	ICI	EAU
Amitriptyline	B: 2	A: 1
Analgesics	C: 4	C: 2
Hydroxyzine	D: 1	A: 1
PPS	D: 1	A: 1
Cyclosporine	C: 3	A: 1
L-arginine	-A: 1	
Antibiotics Regimens	D: 4	
Azathioprine	D: 4	

Treatment	ICI	EAU
Lidocaine	C: 2	
DMSO	B: 2	A: 1
Heparin	C: 3	
Hyaluronic Acid	D: 1	B: 2
Chondroitin Sulfate	D: 4	B: 2
PPS	D: 4	A: 1
Capsaicin/RTX	-A: 1	
BCG	-A: 1	
Oxybutinin	D: 4	
BTX –A	B:3	

Pain clinic's initial algorithm



Conservative Treatment - GoR

Treatment	ICI
Behavioral Modification	B:2
Physical Therapy	A:1
Stress Reduction	C:4
Dietary Manipulation	B:2

Manual Treatment

Internal Massage

- Myofascial Release Techniques:
- Direct pressure/compression
- Strumming
- Lateral stretching
- Contract-relax

What does internal massage accomplish?

- Breaks pain-spasm-pain cycle
- Restores normal muscle tone
- Restores normal length tension relationship
- Increases blood flow
- Increase elasticity of tissue at vaginal opening

Does internal massage work?

Weiss et al (2001)

- 42 pts with urgency-freq syndrome or IC
- 1-2 visits of PT, 8-12 wks
- 83% of urgency-freq patients/70% of IC pts had marked or mod improvement in symptoms

Does internal massage work?

Oyama et al. 2004

- Patients with IC and HTPF (n=21)
- Transvaginal massage 2x/wk x 5 wks
- Statistically significant improvement in:
  - Symptom and problem index (O'Leary Sant Questionnaire)
  - Pain and urgency VAS
  - Physical and mental component from Quality-of-Life Scale

Medical Adjuvant Treatment: HTPFD

Myorelaxant drugs
(relax skeletal muscle/ inhibit spasm)

-mataxolone/Skelaxin
-cyclobenzaprine/Flexeril
-tizanadine/Zanaflex

Butrick CW. 2009. Obstet Clin N America 36;707-722.

Medical Adjuvant Treatment: HTPFD

Anxiolytic + myorelaxant
(binds to benzodiazepine sites on $GABA_A$ receptor)
-diazepam / Valium 2mg QD-TID
-lorazepam / Ativan 1mg QD - PRN
-alprazolam /Xanax .25-.50mg
Anticonvulsants:
-gabapentin/Neurontin
-pregabalin/ Lyrica
SRNIs
-duloxetine HCL /Cymbalta
-mulnacipran / Savella

Rogalski et al 2010 Intl J Urogyn 2010; Butrick CW. 2009. Obstet Clin N America

HTPFD Diazepam Suppositories

- Diazepam is commonly used in treatment of muscle spasms, in suppository form it may give localized relief with a lower incidence of systemic side effects.
  - vulvar pain
  - dyspareunia
  - overactive bladder
  - interstitial cystitis
  - Constipation
  - urinary retention

Diazepam suppositories

- Rogalski et al 2010
- N=26
  - 100% HTPFD; 85% dyspareunia, 81% CPP, 61% IC
- Interventions: PT, TrP injx and 10 mg diazepam vaginal suppositories, inserted nightly for 30 days.
- 25 /26=" improved sexual comfort"
- Abstinence reversed in 6/7

Rogalski, M, Kellogg-Spadt, S et al, 2010, Intl Urogyn J, 895–99

HTPFD Medical treatment:

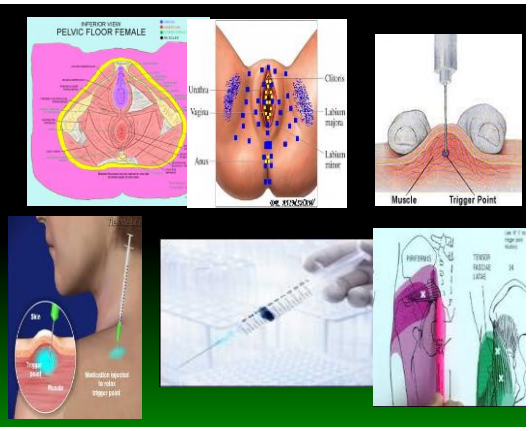
- Carrico et al 2010
- Safety /efficacy of diazepam suppositories
- 11 pts (IC-PFD) V5-10 supp. TID
- After 30d: 64% "moderate/marked improvement" and no s/e
- Serum levels WNL =mean 0.29
- Ref range (0.2-1.0 mcg/ml)
- 36% mild drowsiness; no respiratory suppression; no worsening of pain

Carrico DJ, Burks FF and Peters KM 5/2010, Urology/Times

Triggerpoint needling

- **TrP needling:** a method of directly inactivating TrP's -particularly those refractory to myotherapy.
- TrP is penetrated with fine needle, eliminating TrP as a painful focus.
- Needle inserted w/o medication (or lidocaine and antinflammatory medications can be added.)

www.American HealthandWellness.com 2010.



HTPFD Medical Treatment:

PFM TrP Injx

-Kang et al. N=104 Levator spasm
Lidocaine .5cc /triamcinolone .5cc
Painfree 30.1%/moderate to mild relief 64.7%

-Langford et al N=18 Levator spasm
Bupivicaine and lidocaine 5 ml/TrP
Painfree 33% / 39% >50% improvement in s/s

Kang et al Dis Colon Rectum 2000,1288-91 ;Langford CF et al. Neurourodyn 2007,59-65; Doumouchtsis et al 2010 epub.

HTPFD Medical Treatment:

PFM TrP Injx

-Doumouchtsis et al 2010

N=53 perineal pain/ dyspareunia
10ml bupivicaine/100mg hydrocortisone/1500 u hyaluronidase 2 injections 1 month apart

*27 /53 painfree
*16/53 mild pain but able to resume intercourse within 8 weeks

Kang et al Dis Colon Rectum 2000,1288-91 ;Langford CF et al. Neurourodyn 2007,59-65; Doumouchtsis et al 2010 epub.

Botox and High Tone Pelvic Floor Dysfunction

- 12 women with CPP and HTPFD
- 40 U B/L PR, PC
- F/U at 2, 4, 8, 12 wks
- Dyspareunia VAS 80→28 (p=0.01)
- Dysmenorrhea VAS 67→28 (p=0.03)
- 25% ↓ manometry at 3 mo (p<0.0001)

Jarvis et al. J. OB & GYN. 2004; 44: 46-50

Botox and High Tone Pelvic Floor Dysfunction

- Double blinded RCT, 6mos.
- 60 women with CPP > 2y and PF spasm
- 30 received 80 U into PFM (BTX group), 30 Saline.
- BTX group: Dyspareunia VAS 66→12 (p<0.001), nonmenstrual pelvic pain VAS 51→22 (P=0.009)
- Placebo: only dyspareunia ↓ significantly (VAS 64 vs 27)
- Vag manometry ↓ significantly in both groups 49-32cm H20, 44-39cm H20
- ***However no difference in pain scores between 2 groups***

•Abbott et al. OB & Gynecol. 2006; 180: 915-923

PAIN® 147 (2009) 224–232
www.elsevier.com/locate/pain

Diffuse analgesic effects of unilateral repetitive transcranial magnetic stimulation (rTMS) in healthy volunteers

Frédéric Nahmias [a,1], Claire Debes [a,1], Daniel Ciampi de Andrade [a,b], Alaa Mhalla [a], Didier Bouhassira [a,c,*]

PAPER

Longlasting antalgic effects of daily sessions of repetitive transcranial magnetic stimulation in central and peripheral neuropathic pain

E M Khedr, H Kotb, N F Kamel, M A Ahmed, R Sadek, J C Rothwell

See Editorial Commentary, p 761 J Neurol Neurosurg Psychiatry 2005;76:833-838. doi: 10.1136/jnnp.2004.055806

EJP European Journal of Pain

ORIGINAL ARTICLE

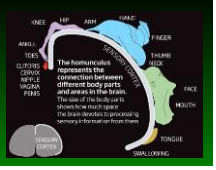
H-coil repetitive transcranial magnetic stimulation for pain relief in patients with diabetic neuropathy

E. Onesti[1], M. Gabriele[1], C. Cambieri[1], M. Ceccanti[1], R. Raccah[2], G. Di Stefano[1], A. Biasiotta[1], A. Truini[1], A. Zangen[3], M. Inghilleri[1]

•Cross-over double-blind controlled, with application of high-intensity rTMS to the motor cortex relative to the lower limbs in 25 diabetic patients suffering from chronic neuropathic pain resistant to medication.

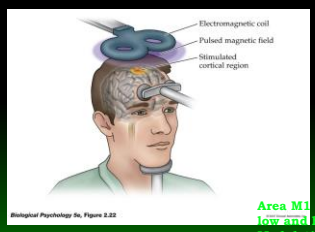
• Outcomes: changes in perceived pain (subjective) and what measurable neurophysiological (objective) after 5 days of treatment compared to placebo.

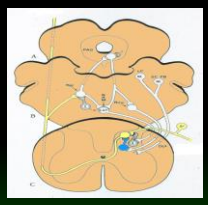
• H-coil arrangement in order to stimulate the motor area relative to both lower extremities.



Transcranic Magnetic Stimulation

Central activation Descending System Pain modulating

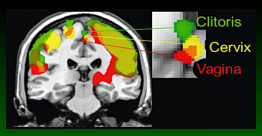


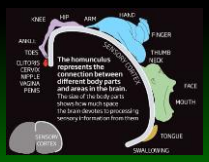


Area M1 and dorso-lateral prefrontal cortex low and high frequency Stimulation Modulation GABAergic system (rec NMDA, Calcium release, induction LTP) Glutammate cells increased sensitivity

Proposal for Research Project

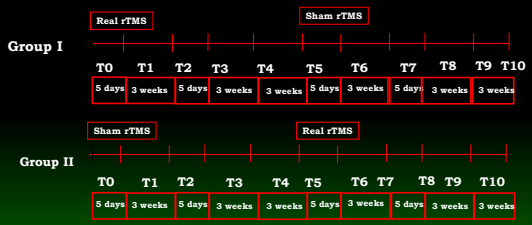
To evaluate the efficacy of TMS applied to the motor cortex M1 through H-coil as a treatment of neuropathic pain and urinary disorders resistant to drug therapy in patients with Bladder Pain Syndrome.





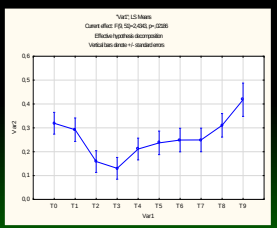
Study Design

A group of patients (Group I) will be treated with real-rTMS in the first 3 months and with sham-rTMS over the next three months; the second group (Group II) will be treated before with sham-rTMS, then with real-rTMS

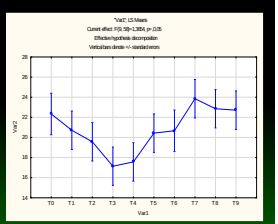


RESULTS

Eight women were enrolled (mean+SD: 55.5+10 years). The delay between the onset of symptoms and the inclusion in the study was 18+9.5 years. At the enrollment, the DN4 was 5.28+1.38 and the sensitization scale score was 66.4+20.

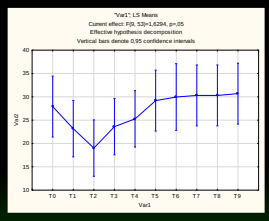


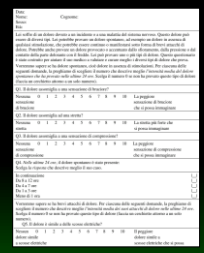
The bladder residue volume significantly reduced after the rTMS (p=0.02)



The OABq score reduced significantly after the rTMS (p=0.05)

RESULTS



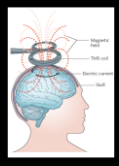


The NPSI score reduced after the rTMS (p=0.05)

The changes in FPPS, MPQ, O'Leary Sant Questionnaire, and SF-36 were not statistical significant.
The VAS for pain and BDI reduced but not significantly.

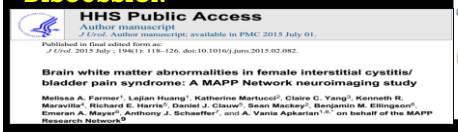
DISCUSSION

The preliminary results of this pilot study show that the rTMS of the brain motor cortex related to the pelvic area changes both the subjective perception of the pain and the objective measurement of bladder voiding.



A placebo effect could be ruled out because a long latency between the treatment and the effects was demonstrated. Moreover, the depression did not improved before the changes in painful and urinary parameters, meaning that the change of psychic disease did not cause the clinical improvement reported.

DISCUSSION



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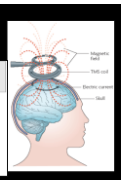
Author manuscript
J Urol. Author manuscript; available in PMC 2015 July 01.

Published in final edited form as:
J Urol. 2015 July ; 194(1): 118–126. doi:10.1016/j.juro.2015.02.082.

Brain white matter abnormalities in female interstitial cystitis/ bladder pain syndrome: A MAPP Network neuroimaging study

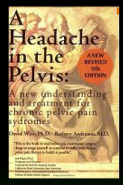
Melissa A. Farmer[1], Lejian Huang[1], Katherine Martucci[2], Claire C. Yang[3], Kenneth R. Maravilla[4], Richard E. Harris[5], Daniel J. Clauw[6], Sean Mackey[7], Benjamin M. Ellingson[8], Emeran A. Mayer[9], Anthony J. Schaeffer[1], and A. Vania Apkarian[1,4,*] on behalf of the MAPP Research Network[9]



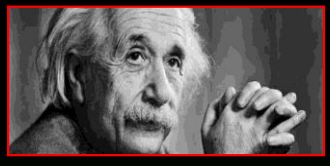
Our results are consistent with the recent characterization of brain white matter micro structural abnormalities in women with BPS, suggesting a brain neuropathological contribution to chronic pelvic pain.

CONCLUSIONS

Deep H-coil rTMS applied to the motor cortex could be provide pain and urinary disturbances relief in patients with BPS.



The interpretation of this results is limited by the small sample size, and more data are certainly need to confirm this preliminary report and to better understand the mechanisms by which rTMS may modulate pain and urinary disturbances in BPS patients.



"Let's not pretend that things will change if we keep doing the same things....."

Take Home Message

Multimodal Treatment for HTPFD & BPS/IC

Multidisciplinary Team

ICS 2016

Case presentation

PATIENT

MR 32 ys.

From 2012

- **Heaviness**
- **Pelvic pressure**
- **Increased daytime frequency (15 times a day)**
- **Nocturia (3 times a day)**
- **Urgency**
- **Dysuria**
- **Dyspareunia**

Negative urine culture
Burning
Vulvodynia

CLINICAL EVALUATION

PHYSICAL EVALUATION

No Anatomical Defects
Allodynia Labia And Fourchette
Vulvar Q-tip-sensitivity Test ++

Multiple Trigger Points

(mainly on the right side of the body)

- Cervical Spine,
- Emidiaphragm,
- Piriform Muscle,
- Levator & Internal Obturator Muscles

SUGGESTED THERAPY

- **Analgesics**
- **Myorelaxants**
- **Physiotherapy /BFB**

Poor response

SUGGESTED THERAPY

Botox injection

- **50 IU into vestibulum**
- **100 IU into Levator and internal obturator muscles**

SUGGESTED THERAPY

Antibiotics
NSAID
Amytriptiline
Gabapentin
Bladder instillation with Cortisone

Poor answer

CLINICAL EVALUATION

NEUROPHYSIOLOGIC EVALUATION OF PELVIC FLOOR

Mild Pudendal Neuropathy
(Right Side, Somatosensory Branch)

SUGGESTED THERAPY

- **Physiotherapy Approach**

  Temporary improvement
- **Postural Approach**

  No effect
- **Psychoterapeutic Approach**

2012

Urodynamics

First desire: 40 ml

Cystometric capacity: 170 ml

No detrusor overactivity

Hypocontractility

Cystoscopy

Trigone with pink point haemorrhages

Pale bladder mucosa

December 2014

Bladder hydrodistension

Glomerulations++

Bleeding++

Bladder biopsy

erosions of the urothelium

> 30 mast cells/mm^2 in the detrusor muscle

After hydrodistension

Palmiltoiletanolamide (PEA) to reduce degranulation of mastcells

IMPROVEMENT

Reduction in frequency to 8-10 times a day

After hydrodistension

bladder instillation with:

Hyaluronic ac and Chondroitine sulphate ,

Once a week 6 mos

After hydrodistension

10 sessions of magnetotherapy

Perineal rehabilitation

RESULTS

VAS PAIN : 8, 5→ 4,1

OBSERVATIONS

1. Could a psycological evaluation be helpful in the management of this patient?

2. A pat with CPP and HYPFD:

poor response with traditional RX,

think a bladder as a possible source of problem

Take Home Message

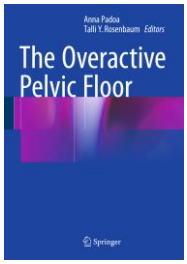
Multimodal Treatment for HTPFD & BPS/IC

Multidisciplinary Team

The Overactive Pelvic Floor and Sexual Function

Anna Padoa, MD
Urogynecology and Pelvic Floor Service
Assaf Harofeh Medical Center

Disclosure



Topics

- Role of the pelvic floor in sexual function
- OPF and sexual dysfunction in women
- Female genito-pelvic pain/penetration disorder
- Emotional issues and pelvic floor overactivity

The Pelvic Floor and Female Sexual Function

- Kegel, 1948:
  - a technique for strengthening the striated pelvic floor musculature as a treatment for urinary stress incontinence. *Several women reported enhanced erotic sensations in their genitals and a greater ability to experience orgasm.*
- Pubococcygeal muscle strength was found to be higher in orgasmic than anorgasmic women.

Kegel AH. Am J Obstet Gynecol 1948;56:238-48.
Graber G, Kline-Graber G. J Clin Psychiatry 1979;40:348–51.

The Pelvic Floor and Female Sexual Function

- Masters and Johnson,1966: voluntary and involuntary pelvic floor contractions occur during sexual arousal in both genders.
- Involuntary and rhythmic contractions of the pelvic floor muscles seen during orgasm, with 0.8-second intervals.
- The intensity of the pelvic floor contractions during arousal and orgasm appeared to decrease with age.

Masters WH, Johnson VE. Human sexual response. Boston: Little Brown; 1966.

The Pelvic Floor and Female Sexual Function

- Bohlen and colleagues observed three different patterns of orgasmic contractions in eleven women aged 24-33.
  - First type: a small number of regular contractions subjectively indicated orgasm onset
  - Second type: twice as many regular contractions followed by additional irregular contractions.
  - Third type: a small number of women reported experiencing orgasm without any pelvic floor contractions.

Bohlen JG et al. Arch Sex Behav 1982;11:367–86.

The Pelvic Floor and Female Sexual Function

- Sherfey, 1974: venous congestion and stretching of the pelvic muscles stimulate muscle nerve endings such that they begin to contract. These muscular contractions, perceived as pleasurable, constitute the experience of orgasm.
- Shafik, 2008: involuntary pelvic floor activity during stimulation of the clitoris, which he considered to be a clitoromotor reflex.
- The levator ani is involved in vaginal elongation, uterine elevation and vaginal muscle contractions, possibly facilitating the male genital response, resulting from penile thrusting.

Sherfey MJ. J Sex Marital Ther 1974;1:97-109.
Shafik A, et al. J Reprod Med 2008;53:111-6.

Does pelvic floor muscle training enhance sexual arousal and orgasm?

- Messe and Geer, 1985:
  - Vaginal contractions without additional sexual stimulation enhanced both genital and subjective sexual arousal relative to baseline
  - Possible mechanisms:
    - increased stimulation of stretch and pressure receptors during intercourse may lead to enhanced arousal and orgasmic potential
    - pubococcygeus exercises might focus a woman's attention on her genitals; this shift in attention might result in an increased perception of pleasure

Messe MR, Geer JH. Arch Sex Behav 1985;14:13-28.

Does pelvic floor muscle training enhance sexual arousal and orgasm?

- In women who were coitally orgasmic in less than 30% of intercourse events, PFMT did increase pubococcygeus strength with no improvement on coital orgasmic frequency
- 46 women with orgasm difficulties practicing PFMT over a 12-week period vs. relaxation vs. attention control group: no difference in orgasmic outcome
- 32 sexually active postmenopausal women who all had the ability to contract their pelvic floor muscles: PFMT had no impact on sexual function

Chambless DL et al. J Consult Clin Psychol 1984;52:114–8.
Roughan PA et al. J Sex Marital Ther 1981;7:223-9.

Does pelvic floor muscle training enhance sexual arousal and orgasm?

Conclusion:

Contrary to the promising findings of the early studies, women who do not have a low tone pelvic floor and who seek to enhance sexual arousal and orgasms, have not much to gain from pelvic floor muscle training.

A relaxed pelvic floor and mindful attention to sexual stimuli and bodily sensations seems a more effective means of enhancing sexual arousal and orgasm

Sexual function in women with pelvic floor dysfunction

- Studies on pelvic floor dysfunction and sexual dysfunction: conflicting results
- Limitation: no distinction between high-tone and low-tone pelvic floor dysfunction

A relaxed or low tone pelvic floor is associated with better sexual function.

Sexual arousal and orgasmic pleasure are not enhanced by high tonus of the voluntary, striated muscles of the pelvic floor.

- 85 patients referred to physical therapy were divided in a high and low pelvic floor tone:
  - women in the middle age group: better sexual function than younger (< 30 yrs) and older (> 50 yrs) women
  - women with low tone pelvic floor had higher sexual function scores than women with OPF
  - Women with a low tone pelvic floor had lower FSFI sexual pain scores.

Bortolami A et al, J Sex Med J Sex Med. 2015;12(5): 1233-41

Female genito-pelvic pain/penetration disorder

Female genital pain can result from various causes, including inflammation, dermatoses and infections.

Up to 16% of the female population is diagnosed with vulvar pain syndromes, also known as vulvodynia, defined as genital pain in the absence of an identifiable cause

Female Genital Pain and Penetration Disorders

- DD of vulvovaginal pain disorders, ISVVD – 2003

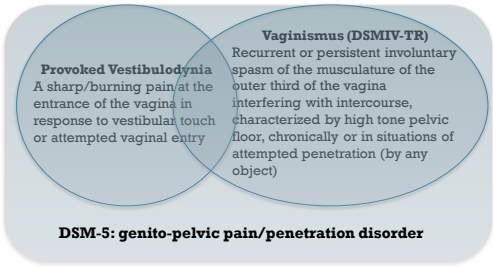
A) VULVAR PAIN RELATED TO A SPECIFIC DISORDER

1. Infectious (e.g. candidiasis, herpes, etc)
2. Inflammatory (e.g. lichen planus, immunobullious disorders, etc.)
3. Neoplastic (e.g.Paget's disease, squamous cell carcinoma, etc.)
4. Neurologic (e.g. herpes neuralgia, spinal nerve compression, etc.)

B) VULVODYNIA

1. Generalized
   1. Provoked (sexual, nonsexual, or both)
   2. Unprovoked
   3. Mixed (provoked and unprovoked)
2. Localized (vestibulodynia - previously known as vulvar vestibulitis, clitorodynia, hemivulvodynia, etc.)
   1. Provoked (sexual, nonsexual, or both)
   2. Unprovoked
   3. Mixed (provoked and unprovoked

Female genito-pelvic pain/penetration disorder

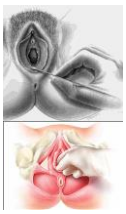


Provoked Vestibulodynia (PVD)

Symptoms

- History of introital dyspareunia
- Sometimes partial or complete cessation of intercourse because it is too painful
- Pain with tampon use, bicycle riding etc
- Tenderness may be confined to the posterior or anterior vestible
- Can be primary or secondary

Examination



- Inspection
- Q-tip examination
- Pelvic floor muscle tone assessment

Provoked Vestibulodynia (PVD)

Possible Causes:

- **Chronic inflammation:** e.g., following repeated vuvlovaginal infections
- **Neurogenic vulnerability:** an initiating event or series of events may lead to chronic vulvar pain
- **Genetic variations:** may predispose some patients to exaggerated inflammatory responses

Provoked Vestibulodynia (PVD)

- Goldstein's classification of PVD:

1. **Hormonally mediated**- after OC, menopause, breastfeeding. Low Testosterone, low libido, dryness. Whole vestibule involved.
2. **Hypertonic pelvic muscle dysfunction**- other symptoms of hypertonicity, musculoskeletal disorders, anxiety. Posterior vestibule involved
3. **Neuroproliferative**- increased number of nociceptors in the vestibular mucosa. Congenital or acquired. tenderness of the entire vestibule

OPF and sexual arousal in women with sexual pain disorders

- Apparently, genital response in women with dyspareunia is not impaired
- Genital response was found to be impaired, however, by fear of pain
- Brauer et al: diminished genital arousal in women with dyspareunia, but equally great in sexually functioning women, during erotic film viewing when the participant was under the threat of a painful stimulus at her ankle (= fear of pain)

Brauer M et al Arch Sex Behav 2006;35:191-200
Brauer M et al Eur J Pain 2007;11:788-98.

OPF and sexual arousal in women with sexual pain disorders

- Fear of pain may result in increased pelvic floor activity, as part of a defensive reaction
- The pelvic floor musculature, like other muscle groups, is indirectly innervated by the limbic system and therefore highly reactive to emotional stimuli and states
- van der Velde et al: increased pelvic floor EMG in women with and without vaginismus in response to an anxiety provoking film

van der Velde J et al, Int Urogynecol J Pelvic Floor Dysfunct 2001;12:328–31

OPF and sexual arousal in women with sexual pain disorders

- Empirical evidence shows increased pelvic muscle activity to be associated with reduced blood flow to the vagina during sexual stimulation

⇒ In women with PVD, the combination of increased PF muscle activity and lack of lubrication causes increased friction resulting in pain, tissue damage or irritation of the skin

⇒ Or, increased pelvic muscle activity may result in muscle pain, reduced blood flow to the vulva and vagina, and consequently, as a result of fear of pain, in reduced lubrication

Both S, van Lunsen R, Weijenborg P, Laan E. J Sex Med 2012;9:2888–902

Pelvic floor overactivity as an emotional response

- In cases of actual or imminent physical or mental pain the pelvic floor muscles will involuntarily, and often unconsciously, contract.
- Pelvic floor activity was found to be significantly enhanced during sexually threatening film excerpts, but also during anxiety evoking film clips without sexual content.
- **In sexual abuse survivors, the pattern of pelvic floor activity was highest during the sexually threatening film clip and the film clip with consensual sexual content**.

van der Velde J, Everaerd W. Behav Res Ther 2001;39:395–408

Pelvic floor overactivity as an emotional response - PTSD

- Yehuda, Lehrner and Rosenbaum, 2015:

Sexual difficulties in individuals with PTSD:

the hormonal and neural circuit activation that normally leads to positively valenced sexual arousal and activity is already overactive in PTSD, possibly through reduced anterior cingulated activity, but leads to anxiety, fear, and other PTSD symptoms, such that sexual arousal signals impending **threat rather than pleasure**

Yehuda R, et al. J Sex Med. 2015 May;12(5):1107-19

Pelvic floor overactivity as an emotional response - PTSD

- The relation between childhood victimization and pain in adulthood seems to be moderated by the presence of PTSD in adulthood
- PTSD is a major mediator in the relationship between the experience of rape and adverse health outcomes and a direct predictor of sexual problems
- Rape victims as compared to controls: 2.7 times more likely to have PF dysfunction (provoked vulvodynia, LUTS and IBS) and 2.4 times more likely to have a sexual dysfunction

Raphael KG, Widom CS. Pain 2011;152:163-9.
Yehuda R, et al. J Sex Med. 2015 May;12(5):1107-19
Postma R. et al. J Sex Med 2013;10:1978–87

Pelvic floor overactivity and other sexual and emotional issues

Attachment style

related to sexual pain. Granot and colleagues found that women with dyspareunia were more likely to be *insecurely attached*

Painful orgasm

related to involuntary clonic pelvic floor contractions associated with orgasm, which become painful in women with a chronically overactive pelvic floor

Patients with OPF often have

other stress-related complaints: neck/shoulder area pain, (tension and sexual arousal) headaches

Behavioural issues

like a limited non-coital sexual repertoire, add to the likelihood of sexual arousal being insufficient for pain free intercourse

Granot M et al, J Sex Marital Ther, 2011;37:1-16
Biehl K et al, Cephalalgia, 2007;27:1271–3.
Both S et al, J Sex Med 2012;9:2888–902 .

Main references

"The Overactive Pelvic Floor". Padoa A, Rosenbaum T Editors.

- Ellen Laan, PhD, & Rik van Lunsen, MD, PhD: Overactive Pelvic Floor: Female Sexual Functioning
- Ahinoam Lev-Sagie, MD: Female Genital Pain and Penetration Disorders

Evaluating and understanding pelvic floor muscle overactivity

A physiotherapist perspective

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Affiliations to disclose†:

No disclosure

† All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

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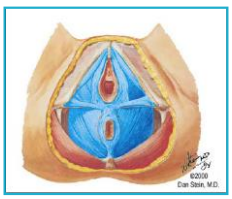
- ☒ Institution (non-industry) funded
- ☐ Sponsored by:

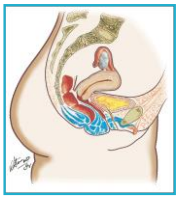
OBJECTIVES

1. To present the current assessment tools for evaluating pelvic floor muscle (PFM) function and discuss these in light of muscle physiology
2. To discuss the implication of PFMs in the pathophysiological mechanisms of pain syndromes
3. To present the findings in the literature on the efficacy of physiotherapy.

Context

- PFM overactivity plays a crucial role in several conditions such as bladder and bowel elimination disorders, genital/pelvic pain syndromes and sexual dysfunctions





5

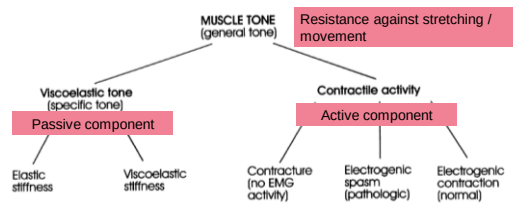
PFM OVERACTIVITY

WHAT DOES IT MEAN ?

Tone / tonicity / hyper and hypotonia / tensions / trigger points / spasm / cramp / relaxation difficulty / stiffness / contracture…

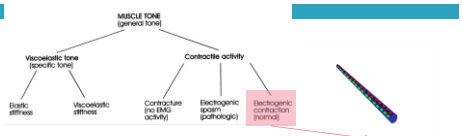
?

Muscle physiology



(Simmons, 1998)

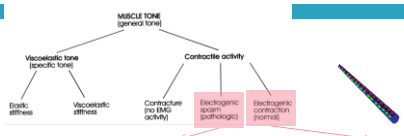
Muscle physiology



-Normal resting activity
-Recorded by EMG
-Resting activity = controversies (Lakie, 1979; 1980)
-Myotatic reflex

(Simmons, 1998)

Muscle physiology

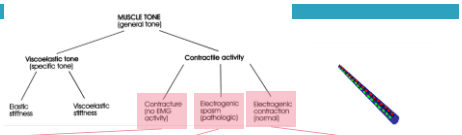


-spasm: ↑ EMG
-Cramp: ↑ EMG+ pain
- Tensions: unintentional muscle activity that is amenable to voluntary control

-Normal resting activity
-Recorded by EMG
-Resting activity = controversies (Lakie, 1979; 1980)
-Myotatic reflex

(Simmons, 1998)

Muscle physiology



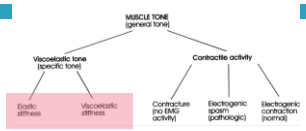
-Not recorded by EMG
-Trigger point (TrP)

-spasm: ↑ EMG
-Cramp: ↑ EMG+ pain
- Tensions: unintentional muscle activity that is amenable to voluntary control

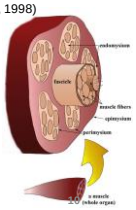
-Normal resting activity
-Recorded by EMG
-Resting activity = controversies (Lakie, 1979; 1980)
-Myotatic reflex

(Simmons, 1998)

Muscle physiology

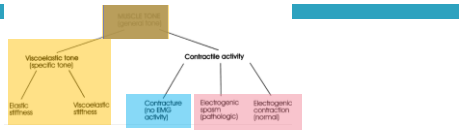


1- Actin and myosin (extensibility of bridges) (Campbell, 1998)
2- Cystoskeleton (titin and desmin)
3- Conjunctive tissues surrounding
muscle fiber (endomysium),
fascicule (perimysium)
muscle (epimysium)



(Simmons, 1998)

Muscle physiology

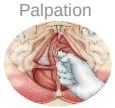


Dynamometry

Manometry

Ultrasound

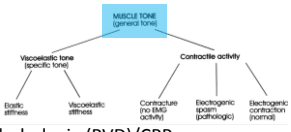
Palpation



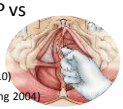
EMG

PFM MORPHOLOGICAL DEFICITS/DYSFUNCTIONS AND VULVODYNIA/CHRONIC PELVIC PAIN (CPP)

Palpation

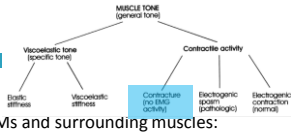


Women with provoked vestibulodynia (PVD)/CPP vs asymptomatic controls:

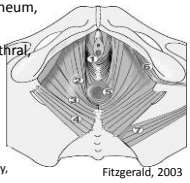


- General muscle tone
  - Reissing's scale (+3 to-3) (Reissing 2004;2005; Gentilcore 2010)
  - Lamont's scale (0 to 4, withdrawal behavior) (Reissing 2004)
  - Dietz's scale (0 to 5, includes pain) (Loving, 2014)
- Relaxation capacity
  - 0 complete relaxation to 4 remains contracted (Gentilcore 2010)
  - Absent/complete/partial (Loving, 2014)
- Flexibility
  - 0 (less than one finger insertion) to 4 (two finger insertions with fingers abducted horizontally ≥2 cm) (Gentilcore, 2010)

Palpation



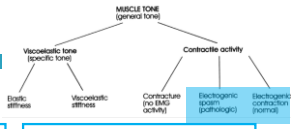
- Prevalence of TPs in the PFMs and surrounding muscles:
  - 63% - 89% in women with CPP (including interstitial cystitis, PVD)
  - 75-88% in men with chronic prostatitis/CPP
- Clinical significance
  - LA = Suprapubic region, urethra, bladder, perineum, penis, rectum
  - Obturator internus = Anal, coccyx, vulvar, urethral, vaginal, or posterior thigh
  - Piriformis= Sacroiliac region, buttock, hip
  - Rectus abdominis= penis, perineum
  - Ext oblique= suprapubic, testes



Fitzgerald, 2003

(Doggweiler-Wiygul 2004; Tu, 2008; Itza 2010; Montenegro, 2010; Bassaly, 2011; Fitzgerald, 2011; Anderson, 2009; Shoskes, 2008)

EMG



PFM resting activity

Significant difference

White, 1997 

Frasson, 2009 

Loving, 2014 CPP 

Non-significant difference

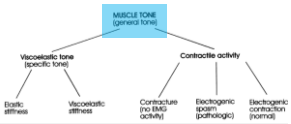
Reissing 2004 

Engman, 2004 

Gentilcore,2010 

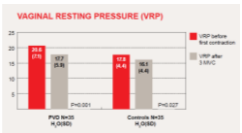
Naess, 2015

Manometry

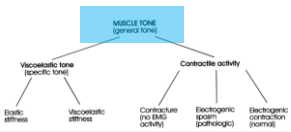


Naess 2015 in 35 PVD and 35 controls

- Women with PVD had significantly higher vaginal resting pressure
- Reduction in PFM resting pressure after a maximal contraction in women with PVD indicating that contracting the PFMs can be used as a muscle relaxation technique.



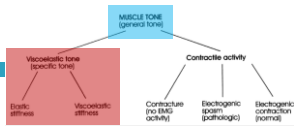
3D/4D Ultrasound



- In comparison to controls, women with PVD showed (Morin, 2014)
  - More acute ano-rectal angle
  - Larger levator plate angle
  - Smaller levator hiatal area

- Similar findings in men with CPP (Davis 2011)

Dynamometer



- Dynamometric speculum (Morin, 2010)
  - Higher passive force at minimal aperture
  - Tolerated a lower maximal aperture
  - Dynamic stretches: elevated passives forces and stiffness
  - Same results when monitoring EMG to isolate passive contribution

- Myoton (Davidson 2014)
  - Increased stiffness

Summary of findings- PFM overactivity

The available evidence in women with vulvodynia/CPP:

- Elevated global PFM tone (measured by ultrasound, dynamometry and manometry)
- TPs (measured by palpation)
- Increased viscoelastic properties (dynamometer combined with EMG)
- Some patients, elevated tone explained by electrogenic causes (evaluated by EMG)

In men with chronic prostatitis/CPP:

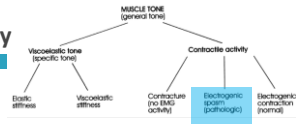
- Elevated global PFM tone (measured by ultrasound)
- TPs (measured by palpation)

PFM function

Alterations of contractile properties in women with PVD/CPP:

- Strength
  - Palpation (Reissing 2004; 2005; Gentilcore-Saulnier 2010; Loving 2014)
  - EMG (Reissing 2004; Glazer 1998;)
  - Ultrasound (Morin 2014)
  - Dynamometer (Morin 2010)
- Speed of contraction/coordination
  - Dynamometer (Morin 2010)
- Endurance
  - EMG (Engman 2004, Reissing 2004; Glazer 1998)
  - Dynamometer (Morin 2010)

Effects of physiotherapy



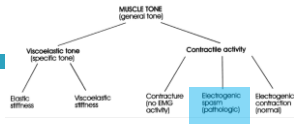
EMG biofeedback (Glazer,1995; McKay 2001; Bergeron 2001; Danielsson 2006)

- Address the electrogenic cause
  - Reduction in pain 34-66% of participants

General relaxation techniques (Hilton 2011)

- Stress management, relaxation breathing, relaxing time with a walk, hot bath, yoga, and meditation

Effects of physiotherapy



Electrical stimulation

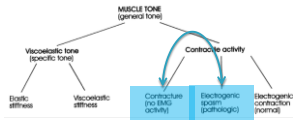
- For reducing pain- TENS (Murina 2008; Dionisi 2008)
- For reducing tension / improving muscle control
  - Reduction of pain (Nappi 2003; Morris 1987; Nappi 2003; Fitzwater 2003)
  - Improvement in strength and in relaxation (EMG) (Nappi 2003)

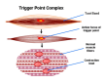
Effects of physiotherapy

Manual therapy (Trigger point / Myofascial release)

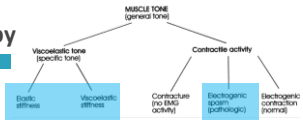
- Sign. reduction in pain in patients with interstitial cystitis, and urological chronic pain and chronic prostatitis (Fitzgerald 2009; 2012; 2013; Anderson 2006)
- Reduction in resting EMG activity (Weiss, 2001)

  Supports the interrelation between contracture and electrogenic spasm





Effects of physiotherapy



Stretching/ insertion (Idama 2000; Murina 2008)

- Sign. reduction of pain in women with dyspareunia
- Auto-insertion - an effective adjuvant to other therapies

Proprioceptive neuromuscular facilitation
(O'Sullivan 2000)

- Contract-relax to promote relaxation
- Efficacy not studied in PFM physiotherapy

Effects of physiotherapy on PFM function

Multimodal physio

(Goldfinger 2009; Gentilcore-Saulnier 2010; Bergeron 2002; Goldfinger 2016)

- Sign. reduction of pain in 51-77% of patients
- Improvement in sexual function
- Reduction in PFM tone (using the Reissing's scale)
- Improvement in relaxation (0 fully able to return to their resting state to 4 remained fully contracted)
- Improvement in flexibility (transverse diameter 0 (less thai one finger insertion) to 4 (two fingers abducted ≥2 cm)
- Increase in PFM strength (modified oxford)

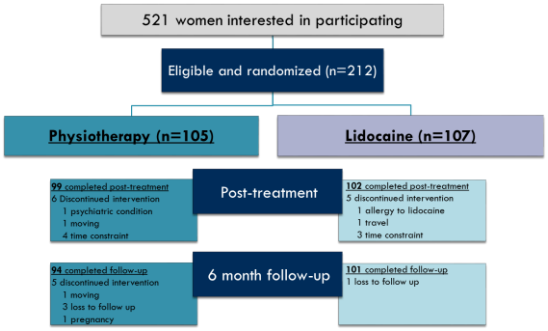
RANDOMIZED CONTROLLED TRIAL OF MULTIMODAL PHYSIOTHERAPY TREATMENT COMPARED TO OVERNIGHT TOPICAL LIDOCAINE IN WOMEN SUFFERING FROM PROVOKED VESTIBULODYNIA

Principal Investigator: Mélanie Morin
Co-investigators: Chantale Dumoulin, Sophie Bergeron, Marie-Hélène Mayrand, Samir Khalifé, Guy Waddell, Marie-France Dubois, PVD Study Group*

Clinical trials.gov NCT01455350
Protocol published - *Contemporary Clinical Trials*, 2016, 46, 52-59

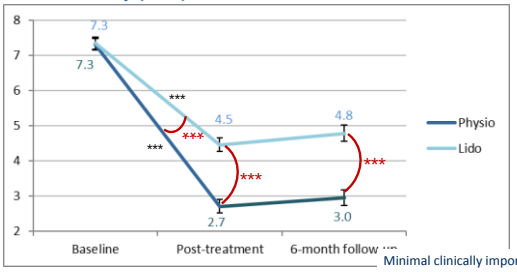
Université de Sherbrooke | Centre de recherche | CHUS | Université de Montréal | iugm | CIHR IRSC

Results- trial flow



Results- Primary outcome

Pain intensity (NRS)



*Adjusted mean ± standard error. ***p<0.0001*

Minimal clinically important difference (MCID) -1.5

Results- Secondary outcomes

	Physiotherapy			Lidocaine		
	Baseline	Post-tx	6-month	Baseline	Post-tx	6 month
Sexual distress	31.8 (1.1)	12.4 (1.1)	14.2 (1.2)	30.5 (1.1)	19.0 (1.1)	19.8 (1.2)
Sexual function	21.1 (0.8)	28.9 (0.4)	28.6 (0.4)	21.9 (0.7)	25.5 (0.6)	25.7 (0.6)

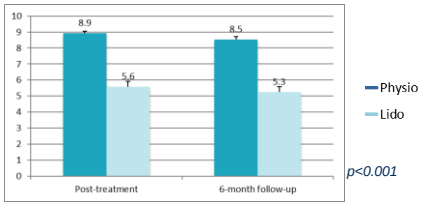
Over the clinical cut-off for sexual dysfunction (Wieger, 2005)

*** *** *** ***

*Adjusted mean ± standard error. ***p<0.0001*

Results- Secondary outcomes

Satisfaction



p<0.001

Patient's global impression of change

- Women reported being very much or much improved:
  - 79% of women in the physiotherapy group compared to 40% in the lidocaine group *(p<0.001)*

Results- Secondary outcomes

	Physiotherapy			Lidocaine		
	Baseline	Post-tx	6-month	Baseline	Post-tx	6 month
Passive force (N)	1.1(0.1)	1.2(0.1)	1.2(0.1)	1.3(0.1)	1.3(0.1)	1.3(0.1)
Maximal aperture (mm)	22.0(0.8)	29.4(0.8)	27.6(0.9)	20.3(0.8)	22.2(0.8)	21.8(0.9)
Maximal strength (N)	3.0 (0.2)	3.4 (0.2)	3.6(0.2)	2.9(0.2)	2.9(0.2)	3.0(0.2)
Number of contractions	8.0(0.4)	10.7(0.4)	11.0(0.4)	8.3(0.4)	8.1(0.4)	9.3(0.4)
Slope of the ascending curve (N/s)	5.2(0.5)	8.5(0.6)	9.1(0.6)	4.8(0.4)	5.1(0.5)	5.9(0.5)
Slope of the descending curve (N/s)	4.4(0.3)	6.1(0.4)	6.5(0.4)	3.5(0.4)	3.4(0.4)	3.9(0.4)
		***	***			

*Adjusted mean ± standard error. ***p<0.0001*

THANK YOU !

ありがとうございます。

Conclusion

- Multimodal physiotherapy is effective in reducing pain, sexual distress, fear of pain and catastrophizing as well as improving sexual function in women with PVD
- Physiotherapy significantly improved PFM function (strength, coordination/control, flexibility)

  Multimodal physiotherapy proved to be more effective than a frequently used first-line treatment - overnight lidocaine topical application

- Further studies needed to evaluate efficacy in other CPP.

Treament of the Overactive Pelvic Floor

Anna Padoa, MD
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Disclosure

Treatment of OPF

A multidisciplinary approach must be adopted, including:

- Physiotheraphy
- Psychosocial treatment
- Medical Treatment

Treatment of OPF

- When approaching OPF patients, the combination of physical and psychosocial interventions is likely the most effective approach
- Psychosocial education and interventions can be included in medical and physical therapy everyday practice and referral to a mental health care professional may be necessary in some cases

Psychosocial Treatment of OPF

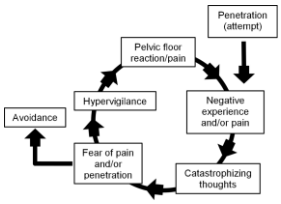
Psychosocial factors affect OPF

1. Psychosocial factors can cause adverse physiological reactions in women with maladapting cognitions regarding vaginal penetration
2. Psychosocial factors are involved in maintenance and exacerbation of pain (PVD <> OPF)
3. Psychosocial factors may impact adherence to physical therapy (avoid risk of failure while keeping hope)
4. Psychosocial factors may negatively impact post-treatment quality of life (medicalized sexuality, loss of erotic appeal)

Psychosocial Treatment of OPF

The Fear-Avoidance Model of Pain

A way to conceptualize the interplay of physiological and psychological factors, adapted to OPF

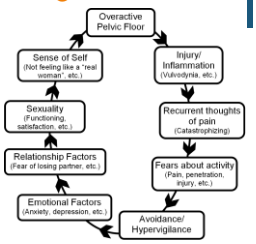


Vlaeyen JWS, Linton SJ. Pain. 2000 Apr 1;85(3):317–32
Alappattu MJ, Bishop MD. Phys Ther. 2011 Oct;91(10):1542–50

Psychosocial interventions for non-psychologists treating OPF

The "vicious cycle of pain"

- Ask the patient to personalize how the "links in the chain" in the vicious cycle apply to her specific situation
- Explain that treatment can tackle any of the links of the chain

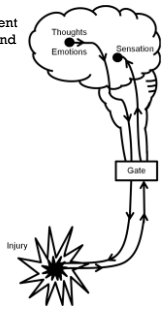


Slade P, Cordle C. Curr Obstet Gynaecol. 2005 Oct;15(5):298–305
Gatchel RJ. In: Gatchel RJ, Turk DC, editors. Psychological approaches to pain management: A practitioner's handbook. New York, NY, US: Guilford Press; 1996. p. 33–52

Psychosocial Treatment of OPF

Pain signals travel up the spinal cord > processed by the brain as nociceptive > efferent fibers descend the spinal cord after thought and emotion processing > modulate signal processing in dorsal horn (augment/prevent)

A basic description of the Gate Control Theory of Pain can assist in identifying thoughts, feelings, activities that "open the gate" to (more) pain



Melzack R, Katz J. The gate control theory: reaching for the brain. In: Hadjistavropoulos T, Craig KD, editors. Pain: psychological perspectives. Mahwah, NJ: Lawrence Erlbaum Associates; 2004. p. 13–34

Psychosocial Treatment of OPF

- Address anxiety : The Rosenbaum mindfulness approach

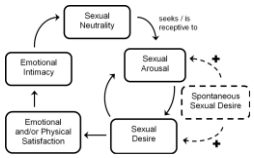
Step 1: Lying on the table. The client is asked to lie on the table, fully dressed, covered with a sheet. She is asked to rate her level of anxiety from low to high (0–5), and then asked what she needs in order to reach the number 0. These needs may include lying on her side in a more protected posture, the practitioner moving away from the table, or, she may need to get up off the table and go back to sitting in the chair, where she was able to rate herself at 0. Other "lowering anxiety" tools are introduced including deep breathing techniques. The exercise is repeated until she is able to lie on the table on her back with her knees flexed and together, and rate herself at 0–1.
Step 2: Lying on the bed, fully dressed (with pants) and covered with a sheet, the client is asked to bend her knees and separate her legs. She is reminded that if she feels anxious with her knees open, she may do what she needs to relieve her anxiety, which is likely to be a return to the position of knees bent and together. This exercise is repeated until she is able to rate her anxiety level with her legs apart at 0–1.
Step 3: As in Step 2 but without the sheet. Covering herself again with the sheet is considered to be one of the lowering anxiety options available to her.
Step 4: As in Step 2 but wearing shorts instead of long pants, first with and then without, the sheet.
Step 5: As in Step 2 but with underwear only, with and without the sheet.
Step 6: As in Step 2 without underwear, with and without the sheet.

Mindfulness: Teach the patient how to attend the pain experience rather than avoid it and examine thoughts and feelings that accompany the pain.

Rosenbaum T, J Sex Marital Ther. 2011 Feb 28;37(2):89–93

Psychosocial Treatment of OPF

- Include the partner in treatment: a "team approach"



Explain Basson's model and its relevance

- normalizes that several factors can interfere with a physically and emotionally satisfying sexual event
- normalizes the low levels of libido in long-term, committed relationships
- Assures the woman that she can stop the cycle at any time without guilt

Davis HJ, Reissing ED. Sex Relatsh Ther. 2007;22(2):245–54
Basson R. J Sex Marital Ther. 2000 Jan 1;26(1):51–65

The clinical approach for safer CSAS care

Concepts from interpersonal practice:

1. *Egalitarian Work*
2. *Exploring Meaning*
3. *Framing and Boundaries*

Seng & Hassinger, J of Nurse Midwifery, 1998

The clinical approach for safer CSAS care

Egalitarian work

- Goal: work to bring the less powerful patient to a greater level of parity (increase her knowledge and ability to act autonomously)
- "interactions" instead of "interventions"
- The survivor has power to influence the plan of care- both over the process and the content
- Distress seen not as a sign of psychopathology but as evidence of coping attempts.

The clinical approach for safer CSAS care

Exploring meaning

- Understanding and explaining how the survivor's distress, her symptoms and her history fit together
- Survivors need to hear normalizing information from their health-care providers on what is happening to them emotionally
- Make the survivor feel that it is safe to bring abuse-related meanings into conversations on plans, conflicts and symptoms

The clinical approach for safer CSAS care

Framing and Boundaries

- *Framing:* keep the elements of the "usual" frame in mind and consider if modifications would be useful
- *Boundaries:*
  - Discuss the **survivor's boundaries** ahead (e.g., treatment by a male obstetrician, pelvic exam, how touch is perceived)
  - **Provider's boundaries**- clinical issues of safety, limited ability of the doctor/nurse to cope professionally with post-traumatic reactions

The clinical approach for safer CSAS care

Practical suggestions- 1

History:

- Always introduce yourself by name and status
- Maintain eye contact
- Include screening questions on sexual and physical abuse
- Response to disclosure: calm, non-judgmental, empathetic.
- Ask how the abuse is affecting her
- Ask how she handles examinations, blood tests…

Hobbins D, JOGNN, 2003

The clinical approach for safer CSAS care

Practical suggestions-2

History:

- Use her own vocabulary regarding the abuse
- Document history of abuse only with the patient's permission
- Avoid a tone of false intimacy
- Avoid asking delicate questions while the patient is disrobing/ sitting on the examination chair

The clinical approach for safer CSAS care

Practical suggestions-3

Physical exam

- During physical and pelvic exams, the caregiver must keep clarity on the professional character of the interaction
- Consider postponing difficult examinations to further meetings and build trust in the meantime
- Suggest a female caregiver if that can help

The clinical approach for safer CSAS care

Practical suggestions-4

Physical exam

- Provide a private, well-lighted room. Knock before entering
- Ask permission to proceed with examination, encourage the patient to ask to stop any time
- Before the examination, explain why, how, where and for how long it is going to take place
- Allow extra time for examinations

The clinical approach for safer CSAS care

Practical suggestions-5

Physical exam

- Allow her to prepare in advance and recover after the examination
- Avoidance of eye contact and focus on the genitals: ritual aimed at neutralizing sexual elements from the pelvic exam. In the case of survivors: may remind of trauma
- Let the survivor choose her position on the examination chair

The clinical approach for safer CSAS care

Practical suggestions-6

Physical exam

- The patient can control the examiner's hand with her own
- Offer her the option to aide with speculum/vaginal probe insertion, show her medical instruments to be used if that may help
- Offer covering- a gown even better than a sheet
- Verbal communication explaining what's going on may prevent dissociative reactions

Medical Treatment of OPF: PVD

Goldstein's approach:

Neuroproliferative PVD:
- topical anaesthetics
- antidepressants,
- antiseizure drugs
- capsaicin cream
- vulvar vestibulectomy

Hormonally mediated PVD:
- stopping hormonal contraception
- topical estradiol (with or without testosterone) to the vestibule

Hypertonic pelvic muscle dysfunction:
- Physical therapy
- cognitive behavioral therapy
- muscle relaxants (valium suppositories)
- Botulinum toxin injections

Medical Treatment of OPF: PVD

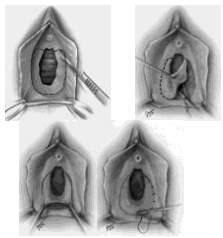
- Evidence for a lack of benefit of:
  - topical 5% Lidocaine, oral Desipramine, botulinum-toxin (BTTA) injections
- Insufficient evidence regarding:
  - steroid and anesthetics injections (trigger point)
  - multilevel nerve blocks
  - Interferon
  - Capsaicin
  - Cyclobenzaprine (muscle relaxant)
  - Topical Gabapentin, Amitriptyline, Nitroglycerin
  - vaginal Diazepam suppositories

Andrews JC. Obstet Gynecol Surv, 2011;66(5):299–315

Surgical Treatment of PVD

Vulvar Vestibulectomy

Vestibule excision with vaginal advancement:
- A U-shaped area of the vestibule, inner labial fold, and lower portion of the hymenal ring is excised
- A piece of posterior vaginal wall is dissected from the underlying tissue to cover the excised area
- "modified vestibulectomy":excision is limited to half-way up the vestible



Surgical Treatment of PVD

- Efficacy of surgical therapy:
  - Case series including 1138 patients reported an effect varying between 31% and 100%, for patients who reported at least some improvement.
  - Twelve studies reported complete relief as an outcome and the median effect size was 67%.

Complications:
1. Bleeding, Hematoma
2. Infection
3. Complete or partial wound separation
4. Bartholin duct cyst formation
5. Anal sphincter weakness
6. Uneven healing requiring further surgery
7. Vaginismus
8. Vaginal stenosis

Andrews JC. Obstet Gynecol Surv, 2011;66(5):299–315

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