Pelvic Physical Therapy Distance Journal Club
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Article 2: The persistency index: a novel screening tool for identifying myofascial pelvic floor dysfunction in patients seeking care for lower urinary tract symptoms. Ackerman AL, Torosis M, Jackson NJ, et al. AJOG August, 2023. https://doi.org/10.1016/j.ajog.2023.08.017

Introduction: LUTS is common and affects most individuals at some point in their life. But there are few good diagnostic tools to differentiate the types of LUTS, so then many patients don't improve and disengage from care. Better tools are needed to differentiate specific homogeneous phenotypes within LUTS.
Myofascial urinary frequency syndrome, (MUFS) is a new term the authors recently described, for a distinct subset of patients experiencing LUTS, primarily driven by PFM dysfunction. MUFS encompasses sensations of incomplete bladder emptying (without true retention), increased urinary frequency (without true urgency), and a persistent urge to void, primarily caused by pressure or discomfort rather than fear of incontinence. They named this complex of symptoms "persistency." Patients with MUFS often exhibit increased myofascial PFM tone, as confirmed by examinations and electromyography (EMG), and respond positively to myofascial release during pelvic floor physical therapy or EMG.
Medical providers, particularly non-specialists, may encounter difficulties in identifying MUFS as the diagnosis relies on skilled myofascial examination and a full understanding of the symptom complex, further complicated by a lack of objective diagnostic tests.
Aim: This study seeks to address this gap by developing a symptoms-based screening measure which would help to help screen out MUFS from other LUTS subtypes so providers who suspect a myofascial origin of the sx, could then be able to target a physical exam and possible treatments.
It also seeks to address this gap by designing a diagnostic nomogram (a graphic calculation that separates diagnoses) for differentiation between MUFS, Overactive Bladder (OAB), and Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS).

Methods: The study received approval from a local Institutional Review Board and included all female subjects seeking care at a specialized urogynecology clinic. Three validated questionnaires were administered to assess genitourinary pain (Female Genitourinary Pain Index - fGUPI), overactive bladder symptoms (Overactive Bladder Questionnaire - OAB-q), and pelvic floor symptoms across multiple domains (Pelvic Floor Distress Inventory - PFDI-20). Two cohorts were established for derivation and validation purposes. The Derivation cohort comprised 215 subjects from January to December 2018, with 68 exhibiting urinary symptoms attributed to myofascial dysfunction. Myofascial dysfunction was confirmed through standardized pelvic floor exams, perineal surface electrodes, and improved symptoms following myofascial release. Additional LUTS groups included 42 with OAB, 51 with IC/BPS, and 54 asymptomatic controls. They diagnosed the OAB to include sx of UUI, no bladder pain from

exam or questionnaire and detrusor overactivity with urodynamics and the IC/PBS group to include bladder pain on exam and with questionnaire, bladder pain with filling, but no UI.

A Validation cohort of 719 subjects from January to December 2019 was utilized to assess the performance of the Persistency Index (PI). This cohort represented the same LUTS diagnoses, including MUFS (characterized by increased tone or tender points on examination, along with symptoms of frequency, bladder pressure, and incomplete emptying) and who had high-tone PFD (111 subjects), OAB (285 subjects), IC/BPS (53 subjects), and a low-bother group of 209. Participants completed the same three questionnaires and the IC Symptom and Problem Indices (ICSI/ICPI) to measure symptom severity and bother related to urinary frequency, urgency, nocturia, and bladder pain.

The PI was derived using the Least Angle Shrinkage and Selection Operator (LASSO), (a regression analysis method that selects and values relevant questions from the questionnaires while preserving their original relationships.). This was used to create the Persistency Index (PI) using a multivariable logistic regression model. This process resulted in a simple score, with a maximum possible value of 15, incorporating three statistically significant predictors: PFDI-5 (POPDI-5), assessing the sensation of incomplete bladder emptying), fGUPI-5 (evaluating the frequency of the sensation of incomplete bladder emptying), and GUPI-2b (assessing pain or discomfort during or after intercourse). Age was also included in the model. (See "Table", with "a" designating use in PI, Fig 2, and "Supplemental Table 4", (supplements found outside of article PDF).

The authors then integrated the PI with a previously established diagnostic nomogram for IC/BPS and OAB, incorporating the Bladder Pain Composite Index (BPCI), Urgency Incontinence Composite Index (UICI), and Bother Index to create a comprehensive Lower Urinary Symptom (LUS) nomogram, referred to as p-CLUS. This new tool classifies patients into non-bothered subjects, IC or BPS, OAB, or MUFS categories. Diagnostic accuracy was assessed based on the percentage of deviation from skilled physician diagnoses.

Statistics: Between group differences were assessed using Welch's t and chi-square tests and P values were adjusted using the Holm-Bonferroni correction for multiple comparisons.

Results: The development of the PI successfully differentiated MUFS patients from other LUTS subtypes. Primary discriminatory symptoms for MUFS included a pronounced and sustained sensation of incomplete bladder emptying, dyspareunia, and bowel dysfunction (straining during bowel movements and feeling of incomplete bowel emptying). While MUFS patients shared symptoms of urgency and frequency with OAB and IC/BPS patients, they did not experience pain during bladder filling or urinary incontinence.

Their model included age, as this was a significant predictor (MUFS patients are usually younger than others). They then created the PI using age (they added 3 points if the subject was under 50), combined with the other 3 scores, resulting in a simple score with a maximum possible of 15. A PI score of ≥ 7 predicted MUFs patients' symptoms with 80% sensitivity and 61% specificity. (Figure 3). Including age in the model increased the accuracy of MUFS prediction from an AUC of .75 to an AUC of .80.

The authors also developed a model to classify 1084 patients into LUTS subsets (OAB, IC/BPS, and MUFS) with an overall diagnostic accuracy of 82% by combining the PI with the bladder pain composite index and urge incontinence composite index. MUFS patients exhibited a higher

prevalence of symptoms such as pelvic pressure/heaviness, straining during bowel movements, urinary frequency, incomplete emptying, and bladder/pelvic discomfort compared to non-bothered controls.

Strengths: A notable strength of the study is its focus on MUFS, a condition diagnosed subjectively due to the absence of an objective gold standard. The accuracy/strength of the PI may be underestimated due to potential misclassification by physicians during validation. In Figure 4, the 3-D graph illustrates a significant number of OAB patients with elevated PI scores, low BPCI (bladder pain), and low UICI (urgency or UI), raising questions about the accuracy of their original MD diagnoses.

Weaknesses: As mentioned above, the lack of objective tests to identify MUFS may explain the discrepancy between the MUFs and physician diagnosis (which was a reason for the study). The study has its limitations, including an unlabeled table (although the other tables are posted with the Journal article and not included in PDF of the article). There was a confusing designation of PFDI-5 vs. POPDI-5.

Discussion/Principal Findings: The study sheds light on Myofascial Urinary Frequency Syndrome, an underrecognized subtype of LUTS characterized by persistent urges, urinary frequency, bladder pressure, and a sensation of incomplete emptying linked to myofascial dysfunction. The pelvic floor's role in pelvic and visceral function is highlighted, emphasizing that increased muscle tone is not typically considered a contributor to nonpainful LUTS. Pelvic floor dysregulation extends beyond urinary dysfunction, encompassing gastrointestinal and sexual complaints. The study underscores the potential of pelvic floor myofascial physical therapy in managing MUFS.

Conclusion: The Persistency Index (PI) exhibits promise in identifying MUFS and minimizing unnecessary interventions. Further prospective studies are essential to validate its diagnostic utility. Early identification through the PI could facilitate the prompt initiation of targeted pelvic floor physical therapy, possibly eliminating the need for in-person specialist consultations to confirm the diagnosis beforehand.

Discussion Questions:
1) Do you find OAB/PBS patients have elevated myofascial PFM tone as well? How might you treat them vs MUFS patients?
2) They state MUFs presents similarly in the population (20%), to dysynnergic defecation: how often do you see urinary frequency with your constipation/bowel frequency patients and vice versa?

Additional Resources: For further information, refer to the Female Genitourinary Pain Index (GUPI) and its validation:

• Female Genitourinary Pain Index (GUPI) –

https://www.cottagehealth.org/app/files/public/74fd5919-18e5-4043-8d62-85bd990c65cb/CRH_Female_Genitourinary_Pain_Index.pdf

• Validation of GUPI - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2783956