

## CAN WE PREDICT PELVIC FLOOR MUSCLE TRAINING SUCCESS IN WOMEN WITH STRESS AND MIXED URINARY INCONTINENCE USING DEMOGRAPHIC, CLINICAL AND MORPHOLOGICAL PARAMETERS ?

### Hypothesis / aims of study

According to the 5th International Consultation on Incontinence, we know relatively little about how to discriminate, pre-treatment, between women who will and will not respond to pelvic floor muscle training (PFMT). The objective of this study was to determine if demographic, clinical and pelvic floor muscle (PFM) morphology as measured with transperineal ultrasound (TPU) can predict responsiveness to PFMT in women with stress or mixed urinary incontinence (UI).

### Study design, materials and methods

Baseline demographic (age, BMI, number of vaginal deliveries), clinical (UI type, duration and severity) in addition to PFM morphological parameters and post-PFMT continence status were analysed in women, aged 60 and over, participating in a prospective quasi-experimental pre-test, post-test cohort study. To be included in the study women had to describe a pattern of stress/mixed UI on the Questionnaire for Urinary Incontinence Diagnosis QUID (1), have at least three urinary leakage per week, persisting for 3 months or more; and are able to give informed consent and complete a 7-day bladder diary.

In addition to the demographic and clinical parameters, the study assessed six potential morphological determinants under four conditions: at rest, during PFM maximal voluntary contraction, on cough and during Valsalva. The TPU parameters were taken from both the axial and sagittal images. In the axial plane 1. levator hiatus (LH) antero-posterior (LHap) diameter, 2. the LH left-right (LHlr) transverse diameter, and 3. the LH area (LHarea). Each parameter was measured in the 'plane of minimal dimensions'. (2) In the sagittal plane: 4. the bladder-neck (BN) position (X) and 5. the BN position (Y) and 6. the PFM height according to previously described methods. Images were taken with the Acuson Antares ultrasound (Siemens, USA Inc.) with a 3-5 MHz curvilinear 3D/4D probe. Data sets were processed offline using the Syngo Four Sight view tool (V3.1).

The women participated in a 12-week PFMT program (1h/week exercise class and 5 days/week home exercises), an intervention known to be effective for UI. Physiotherapy responsiveness was defined as 'much better' on the Patient Global Impression of Improvement scale (PGI-I). (3)

Univariate analysis was used to examine the association between each of the 30 potential determinants. Determinants that displayed significance were subjected to a backward stepwise logistic regression analysis to determine which combination of predictors best explained responsiveness.

### Results

Seventy three women with a mean age of 68.8 years old (SD: 5.9 years) and stress UI (n =13) or mixed UI (n =60) participated in the study. Among them, 50 (68.5%) were classified as responsive (much better) post-intervention and 23 (31.5 %) were not. In the univariate analysis, age (p=0.04) and BN (Y) position on Valsalva (p=0.01) were related to the outcome of interest. Thus, these two parameters (potential predictors) were retained for logistic regression analysis; ultimately, the 2 were associated with responsiveness.

There was a good model fit with a chi-square of 16.9 (p<0.001), indicating that, combined, the two predictors had reliably distinguished in the pre-treatment phase between those post-treatment participants who were 'much better' following PFMT and those who were not. This model, based on 2 parameters, explained between 20.7 % (Cox and Snell R<sup>2</sup>) and 29.1% (Nagelkerke R<sup>2</sup>) of the outcome variability and correctly classified 71.2% of the participants.

### Interpretation of results

According to the findings, women with a higher BN (Y) position on Valsalva prior to PFMT were 1.125 times more likely to be improved after PFMT (OR 1.125; 95 % CI: 1.04–1.22; p<0.001) controlling for age. Furthermore, older women were 0.857 times less likely to be improved after PFMT (OR 0.857; 95 % CI: 0.772–0.951; p<0.001) controlling for BN (Y) position on Valsalva.

### Concluding message

The study found that age and BN (Y) position on Valsalva were predictive of responsiveness to PFMT. These results need to be validated through a larger prospective controlled trial. Moreover, there is a need to find a PFMT regimen to successfully treat older women with lower BN (Y) position.

### References

1. American Journal of Obstetrics and Gynecology.2005;192:66-73
2. Ultrasound Obstet Gynecol 2005; 25: 580–585.
3. Am J Obstet Gynecol 2003;189:98-101

### Disclosures

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